PHASE I LIMITED SITE INVESTIGATION/ CURRENT ASSESSMENT SUMMARY REPORT HILL 78 AREA, PITTSFIELD, MASSACHUSETTS

VOLUME I
Text, Tables, and Figures

Prepared for

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PHASE I - LIMITED SITE INVESTIGATION/ CURRENT ASSESSMENT SUMMARY REPORT HILL 78 AREA, PITTSFIELD, MASSACHUSETTS

1.0 INTRODUCTION

This report relates to the area known as the "Hill 78 Area" located at the General Electric Company (GE) facility in Pittsfield, Massachusetts. It presents the results of a Phase I - Limited Site Investigation of the Hill 78 Area, as required by the Massachusetts Department of Environmental Protection (DEP) pursuant to the Massachusetts Contingency Plan (MCP) and a consent order executed by GE and the DEP in July 1990. This report also constitutes a Current Assessment Summary (CAS) Report for the Hill 78 Area pursuant to the requirements of a permit issued to GE by the United States Environmental Protection Agency (USEPA) under the corrective-action provisions of the federal Resource Conservation and Recovery Act (RCRA). This combined MCP Phase I/CAS Report has been prepared to meet both the MCP requirements for a Phase I investigation of the Hill 78 Area and the USEPA permit requirements for a CAS for that area (which is designated in the USEPA permit as "Area 2").

1.1 FORMAT OF DOCUMENT

The report is divided into several sections which include a detailed description of the site history and site location, summary of previous investigations conducted at the site, the results of the MCP Phase I investigations, and a characterization of oil and hazardous material at the site. Section 2 describes the site location and environmental setting, while Sections 3 through 5 summarize the historical use of the Hill 78 Area and previous soil and ground-water investigations performed at the site. The MCP Phase I investigation is described in Sections 6 and 7, with a description of additional soil sampling carried out in connection with the Altresco landscaping program in Section 8. Section 9 describes a Short-Term Measure (STM) that has been completed at the site (cover for Hill 78 Landfill) and presents the results of an evaluation of the needs for additional STMs on the site.

Based on the data compiled to date, the source of oil or hazardous materials found at the site is characterized in Section 10, along with the location of other potential sources in the area. The nature of the hazardous materials found at the site (e.g., physical, chemical, fate and transport characteristics) is characterized in Section 11, with migration pathways and exposure information pertaining to these materials being discussed in Section 12.

Section 13 describes supplemental activities that GE is the in process of conducting to verify and complete analytical results for the Phase I Report. Conclusions are presented in Section 14. Section 15 (References) lists the documents referenced in this report. The DEP Potential Oil/Hazardous Materials Release Site Preliminary Assessment Report and Interim Site Classification Form are included as appendices to the report.

1.2 BACKGROUND INFORMATION

The Hill 78 Area is located in the central portion of GE's Pittsfield facility (Figure 1). Included within this area are an on-site landfill (Hill 78 landfill), a RCRA Part B permitted hazardous waste storage facility (Building 78), a storage facility for drums containing polychlorinated biphenyls (PCBs) (Building 71), the Altresco Cogeneration Facility, and parking areas for GE's Ordnance manufacturing operations. The Hill 78 landfill has been used by GE since the early 1940s for the disposal of excavated soils, plant demolition and construction debris, and other solid wastes. In the last decade or so, the materials placed in the landfill included soils and construction debris containing PCBs at concentrations less than 50 milligrams per kilogram (mg/kg). That practice was discontinued in 1990 at the DEP's request, and a cover has recently been placed over the landfill in accordance with a STM plan approved by the DEP.

Due to the disposal of various materials, including PCB-containing materials, at the on-site landfill, the Hill 78 Area has been designated by the DEP as a "confirmed disposal site" under the MCP. Pursuant to a consent order executed by GE and the DEP effective July 2, 1990, GE was required to undertake a Phase I - Limited Site Investigation of this site under the MCP and to prepare and submit a report thereon to the DEP. In August 1990, Geraghty & Miller, Inc. was retained by GE to conduct the Phase I - Limited Site Investigation of the Hill 78 Area.

In addition to the DEP requirements, the USEPA issued a RCRA corrective-action permit to the GE Pittsfield facility in February 1991. That permit requires investigations and corrective action for releases from Solid Waste Management Units (SWMUs) at the facility. For this purpose, the permit divides the Pittsfield facility into various areas, one of which (Area 2) is essentially coextensive with the Hill 78 Area designated under the MCP. The permit designates the landfill in this area as SWMU G-5 (Building 78 Landfill - Gas Plant Site). The permit requires that, in addition to submitting a proposal for a RCRA Facility Investigation (RFI) for the various areas, GE must submit a CAS describing all available data pertaining to the physical and hydrogeologic characteristics of the site and the nature and extent of contamination. The requirements of the USEPA permit are currently stayed pending resolution of an appeal of the permit to the USEPA Administrator. Nevertheless, GE has concluded that, in order to advance the process, facilitate coordination between the USEPA and the DEP, and avoid needless duplication, it would be reasonable to submit a CAS for the Hill 78 Area (EPA-designated Area 2) simultaneously and combined with the report on the MCP Phase I - Limited Site Investigation.

The purpose of the Phase I investigation is to provide the DEP with sufficient information so that the Hill 78 Area can be classified as a priority or non-priority disposal site. This included identifying the types of oils and hazardous materials, potential migration pathways, receptors and exposure points at the site. In accordance with the MCP, Geraghty & Miller conducted a Phase I - Limited Site Investigation of the Hill 78 Area between January and May 1991. Geraghty and Miller also performed a detailed review of available data for the CAS as outlined in the USEPA permit. This report summarizes the scope and findings of the investigation, and provides the data necessary to fulfill the Phase I requirements of the MCP and the CAS requirements of the USEPA permit.

1.3 PREVIOUS STUDIES

Numerous soil boring and ground-water investigations were completed between 1987 and 1990 to determine the nature and extent of fill deposits in the Hill 78 Area. Specifically, several of these programs were initiated to determine if the soils contained PCBs or volatile organic compounds (VOCs) prior to excavation activities. A summary of previous investigations conducted at the Hill 78 Area is presented in Table 1. The results of the previous soil and ground-water investigations completed at the site are described in the "Hill 78 Area MCP Phase I Supplemental Data Summary" dated May 1990 (Appendix A to this report) and in Sections 4 and 5 of this report.

2.0 LOCATION DESCRIPTION AND ENVIRONMENTAL SETTING

A comprehensive description of the site, including its location and topography, surface-water drainage, utilities, water supply, and environmental setting is provided below.

2.1 MAPS AND PHOTOGRAPHS

The Hill 78 Area is centrally located within the GE facility, and comprises approximately 85 acres as shown on the Pittsfield East 7.5 x 15 minute quadrangle United States Geological Survey (USGS) topographic map (Figure 1). The area is bound by Tyler Street Extension on the north, Merrill Road on the south, New York Avenue on the west, and the fence on the western side of Building OP-2 on the east. The Universal Transverse Mercator (UTM) coordinates for the site are 4,701,500m N, 645,500m E. The site is located at 42° 27'10" N latitude and 73° 13'45" W longitude.

The Hill 78 Area encompasses the Altresco Cogeneration Facility, the Building 78 RCRA Part B permitted Treatment, Storage and Disposal Facility (TSDF), the Building 71 Toxic Substance Control Act (TSCA) permitted PCB Drum Storage Facility, the OP Parking Lots, and the Hill 78 landfill. These and other site features are shown on the site map in Figure 2. An aerial photograph of the site taken in April 1990, presented in Appendix B, is the most recent photograph showing the overall layout of the site features.

Maps and diagrams presented in this report include the following: Site Location Map (Figure 1); Site Map (Figure 2); Configuration of the Water Table maps for January and July 1991 (Figures 3 and 4); Surface Soil Sample Locations map (Figure 5); Aerial Photographs (Appendix B); Hill 78 Topographic Maps (Appendix C); Existing Drainage Site Plan (Appendix D); several utility plan diagrams (Appendix E); and the Pittsfield Zoning Map (Appendix F);. Information summarized within these maps will be discussed in the following sections of this report.

2.2 TOPOGRAPHY, SURFACE DRAINAGE AND VEGETATION

The overall topography of the Hill 78 Area slopes moderately to the south and east towards New York Avenue and Merrill Road. Approximately 16 feet of relief is observed from Tyler Street Extension across the site to Merrill Road. The Hill 78 landfill, located in the north-central portion of the site, has been covered as part of a STM and is relatively flat. There are steep embankments on the northern boundary between the landfill and Tyler Street Extension (the low-lying area between the landfill and Tyler Street Extension has been regraded and seeded as part of the STM). Two dirt roads delineate the approximate southern boundary of the landfill, which is characterized by more gently sloping gradients. Three drainage swales (an intermittent stream and two man-made ditches along the Altresco entrance driveway and Merrill Road) are also located on-site and discussed further below. A steep-sided sand bank is located at the southeast corner of the site.

Paved areas within the Hill 78 Area include the OP parking lots, perimeter roads and parking lots around the Altresco Buildings, and two paved entrances (one from Tyler Street Extension and one from New York Avenue) that lead to the Building 78 RCRA Storage Facility. The topography of the site generally slopes to the southeast, towards Merrill Road and the Housatonic River (Appendix C). The remainder of the site is comprised of dirt lots and roads (designated with dashed lines on Figure 2), grassy areas, and small wooded areas which contain a variety of deciduous trees and shrubbery.

Access to the landfill is restricted to GE personnel and contractors via a perimeter fence with secured access gates and television surveillance. Access to the parking areas is monitored by GE security guards.

Surface-water drainage patterns within the Hill 78 Area can be inferred from direct observation of runoff at the site and from the topographic maps in Appendix C; generally, runoff occurs perpendicular to elevation contours. Three main drainage ditches receive runoff from a majority of the site.

An underground sewer and drainage easement runs approximately north-south under the western edge of the landfill from Tyler Street Extension to Merrill Road. This easement begins south of Allengate Road, runs south through the Allendale School property, crosses under Tyler Street Extension, runs south through the Hill 78 Area, underneath Merrill Road, the Penn and Central Railroad tracks and East Street, to Commercial Street, and then leads directly to the Housatonic River (Appendix D).

A surface-water drainage swale runs parallel to, and almost directly above, the underground sewer and drainage easement. This surface-water drainage swale originates approximately 220 feet south of the landfill where a 42-inch reinforced concrete pipe (RCP) emerges from the ground. The water emerging from the 42-inch pipe and flowing into the swale consists of runoff from areas upgradient of the Hill 78 Area. No drainage from GE property enters this 42-inch line. Surface-water runoff is then directed to flow south in an open channel stream where it re-enters a 30-inch RCP which runs underneath Merrill Road and the Penn and Central Railroad. Upon reaching East Street, the surface runoff flows into the sewer and drainage easement discussed above via a storm drain, and is discharged directly into the Housatonic River.

A second drainage ditch runs approximately north-south, parallel to and on the west side of the main Altresco paved entrance off of Merrill Road. This ditch originates near the south-eastern corner of the most southern Altresco Building, where a 21-inch RCP emerges from the ground. Water that enters this drainage ditch flows south to Merrill Road, then turns and flows west until it reaches the 30-inch RCP which discharges underneath Merrill Road.

A third drainage ditch, which runs approximately north-south on the east side of the main Altresco entrance, flows south to Merrill Road where it enters a catch basin. Water entering the catch basin flows into a storm drain which runs beneath Merrill Road and then ties into the storm drain which leads to the Housatonic River. This ditch accepts runoff from the entrance road and from the area north and east of the Altresco buildings.

2.3 GEOLOGIC AND HYDROGEOLOGIC SETTING

Pittsfield, Massachusetts, is centrally located in the Housatonic River Basin between the eastern Berkshire Hills and the western Taconic Range. The Housatonic River originates in Pittsfield where the Southwest, West and East Branch Housatonic Rivers join. The river flows south through Berkshire County, through Connecticut and discharges into the Long Island Sound. The Housatonic River reportedly drains 504-square miles in western Massachusetts (Gay and Frimpter 1985). Water exits the basin through stream discharge, evapotranspiration and subsurface seepage (ground-water flow).

Unconsolidated surficial geologic deposits within the basin (excluding swamps and Recent alluvium) are of glacial origin (Pleistocene age), and are classified as either stratified (glacofluvial and glacolacustrine) or nonstratified (till) deposits. Known thicknesses of these deposits range up to 240 feet and to 90 feet, respectively. Glacial till predominates in the upland areas, and stratified deposits predominate in the basin (Norvitch et al. 1968).

Bedrock in the area is comprised of Cambrian and Ordovician age carbonate rocks (limestone, dolomite and marble) of the Stockbridge Group. Recent borings completed by Geraghty & Miller within the Hill 78 Area encountered bedrock at 60 feet (March 1990) and 63 feet below grade (October 1990). Production wells have been installed several hundred feet into the bedrock to provide cooling water for the Altresco Cogeneration Facility.

Neither the stratified nor nonstratified surficial deposits are considered good aquifers (Norvitch et al. 1968), and the carbonate bedrock will provide water only if a well is installed within a solution or fault zone. Water quality data for the surficial and bedrock aquifers is presented in Table 2.

The "Water Supply Protection Atlas" at the Massachusetts DEP does not indicate the presence of mapped aquifers located in the Pittsfield East quadrangle. The nearest mapped aquifers are within the Hoosick River Basin to the northeast, and the Connecticut River Basin to the southeast, as indicated on the Pittsfield West quadrangle. However, according to Gay and Frimpter (1985), where the thickness of the stratified deposits exceeds 25 feet, the glacial deposit may be considered an aquifer capable of sustaining municipal or industrial water supplies. For the purpose of this report, we will consider an aquifer to be a relatively thick and permeable stratified deposit which is conducive to ground-water movement.

Aquifers and water bodies within the basin are recharged by precipitation (rainfall plus snowfall). Annual rainfall recorded at the Plainfield (P) and Lanesboro (L) weather stations (nearest Pittsfield) in inches, for the past 6 years are as follows: 1985 = 42.75 (P); 1986 = missing data/unrecorded; 1987 = 43.10 (P); 1988 = 40.07 (L); 1989 = 47.06 (L); and 1990 = 53.44 (L). Thus the average precipitation near Pittsfield for the past 6 years (excluding 1986) equals 45.28 inches. It should be noted that the highest amount of precipitation recorded in recent years occurred in 1990.

2.4 PRESENT CONDITIONS

The present conditions of the site are depicted on the site map (Figure 2) which includes the location of the Altresco Cogeneration plant, existing buildings, the Hill 78 landfill, and paved and unpaved areas (indicated by dashed lines). The Hill 78 landfill, formerly mound-shaped and containing uncovered debris, has been covered and hydroseeded as part of a MCP STM. The area north of the Altresco sound barrier (shown on Figure 2) is currently unpaved and occupied by sandy, silty soils. The southeast corner of the site, near the intersection of Merrill Road and New York Avenue, contains stockpiled soils containing less than 2 mg/kg PCB and is the location of a steep excavated sand bank. There are no indications of environmental damage or stressed vegetation on the site.

2.5 UTILITY LOCATIONS

Utilities servicing the Hill 78 Area include electric, water, sewer and surface-water drainage easements. A sewer and surface-water drainage easement runs north-south through the Hill 78 Area, underneath the landfill. This easement connects drainage from Dalton Avenue to Merrill Road, including runoff from the Allendale School. Inactive underground hydrogen, oxygen and nitrogen gas pipelines buried at depths of approximately 2-feet below grade run through the Hill 78 Area from Building 12F to Building 1-A, Plastics.

Abandoned 10C transformer oil pipelines are located at the site in the same trench parallel to the gas lines. 10C transformer oil in Building 12F storage tanks, formerly located east of present Building 100 (located approximately 1,400 feet west of the Hill 78 Area), was transported in underground pipelines to Building 51 at Plastics Avenue to provide the 10C oil for the Bushing Manufacturing Operations. In the Hill 78 Area, the pipelines ran east along the Tyler Street Extension to Building 51. In approximately 1964 a new oil storage tank facility located south of the ConRail rail tracks, north of East Street and west of Building 29B was constructed. The pipeline to Building 51 was discontinued with oil being tankered from the new facility to Building 51. The pipeline was reportedly drained at the low spot along Tyler Street Extension midway between New York Avenue and the Aerospace parking lot west of Building OP-2. In 1989, as part of the Altresco Steam Line distribution system, the former distribution line had to be severed at New York Avenue. The lines were carefully sampled and drained. The two 4-inch lines and one 2-inch line were drained of approximately 754 gallons of 10C oil containing 113 to 707 mg/kg PCB. The oil was incinerated at GE's TSCA permitted Thermal Oxidizer. An additional 1,315 gallons of oil from the eastern pipeline at Building 51 were collected and sent to GE's Thermal Oxidizer for incineration.

Several storm drains (Section 2.2) and other utilities have also been installed in association with construction of the Altresco Cogeneration plant. Refer to Appendix E for these and other utility diagrams.

2.6 WATER SUPPLY LOCATIONS AT AND NEAR SITE

As determined by a review of the DEP's "Water Supply Protection Atlas" and by discussions with GE personnel, public or private water supply wells used for drinking water purposes are not located within a 0.5-mile radius of the site. The four water supply wells at the Altresco facility withdraw water from several hundred feet within the bedrock beneath the site and are used solely for cooling water for plant operations. Individual yields from these wells are reportedly 600 gallons per minute (gpm) from Altresco Supply Well #3 (ASW-3), 200 gpm from ASW-4, and 150 gpm from ASW-6. The yield of ASW-5 is not known. Total pumpage from Wells 3, 5, and 6 for July 1991 was 3.1 million gallons.

According to the Pittsfield Department of Public Utilities, the City of Pittsfield obtains its industrial and municipal water supply from the following surface water bodies east of Pittsfield: Sand Washington Reservoir, Cleveland Reservoir, Farnham Reservoir, New Sackett Reservoir, Lake Ashley, and the Lower Ashley Intake. In the past, Onota Lake has been used for an emergency municipal and recreational water supply.

2.7 LAND USES AT AND NEAR SITE

Land at the Hill 78 Area is zoned as General Industrial (I-G) as indicated on the Pittsfield Zoning Map (Appendix F). Abutting properties to the east and west of the Hill 78 Area are owned by GE and are zoned as General Industrial. South of East Street, land use is zoned as Light Industrial (I-L). Land to the north of the Hill 78 Area is occupied by the Allendale School and single family homes, and is zoned as Residence District R-12 (minimum 12,000-square feet per lot). Several homes are located along the southern and northern sides of Merrill Road south of the Hill 78 Area.

2.8 SURFACE WATER AT AND NEAR SITE

A small intermittent stream within the drainage swale at the south-central portion of the site, and occasional standing water in the swale between the Hill 78 landfill and Tyler Street Extension comprise the only surface-water bodies at the site. The stream flows through a culvert under Merrill Road as shown on Figure 2. The Housatonic River is located to the south of the Hill 78 Area, approximately 600 feet from Merrill Road.

2.9 FLOODING POTENTIAL

The Hill 78 Area is not located within the flood plain of the Housatonic River, as indicated by the Flood Insurance Rate Map (FIRM), Community-Panel Number 250037 0010 C. The 500 year flood plain, at its closest point to Hill 78, is located 300 feet directly south at the junction of Merrill Road and New York Avenue.

2.10 ENVIRONMENTALLY SENSITIVE AREAS AT AND NEAR SITE

The Natural Heritage and Endangered Species Program of Boston, Massachusetts, was contacted to identify rare or endangered species of animals and plants in the Pittsfield area. They report that critical habitats or wetlands are not located at or near the Hill 78 Area. The Wood Turtle (Clemmys insculta) and the American Bitterns (Botaurus lentiginosus), present south of the Hill 78 Area on the opposite side of the Housatonic River, are considered rare and endangered.

2.11 CLIMATOLOGICAL AND METEOROLOGICAL INFORMATION

Information on the climate in the general vicinity of the Hill 78 Area was obtained from the "Upper Housatonic River Basin Study, Berkshire County, Massachusetts" by the United States Department of Agriculture. The climate in the area is characterized as humid with a mean annual temperature of about 46°F. Record temperatures recorded at the Pittsfield airport are a high of 95°F and a low of -25°F.

The average precipitation varies from a low of 2.5 inches during the winter months, to a high of about 5 inches in the summer months. As previously mentioned, the average annual precipitation near Pittsfield for the past six years (excluding 1986) is 45.28 inches.

Historically, the frost-free period is from late May until late September, with the growing season lasting from 120 to 140 days.

Flooding in the area occurs most often in the spring months due to rain and snow-melt; although severe flooding has occurred in late summer and fall during the typically low rain season. Localized flooding is also caused by intense thunderstorms during the summer.

Meteorological information for the site is currently being collected as part of the air monitoring program to assess off-site airborne transport of PCBs. This information will be provided upon completion of the air monitoring program (Section 6.5).

3.0 LOCATION HISTORY

A file review of the Hill 78 Area was conducted to determine past owners and land use, and previous reported spills (on and off-site). The following agencies were visited to obtain the necessary information: the Massachusetts DEP, the Pittsfield Tax Assessors Office, the Berkshire Middle District Registry of Deeds, the Pittsfield Planning/Zoning Board, the Pittsfield Department of Public Works, the City of Pittsfield Municipal Engineer, and the General Electric Environmental and Facility Operations (EFO) Group.

3.1 PAST AND PRESENT SITE OWNERS

Available records at the Pittsfield Tax Assessors office regarding the Hill 78 Area are limited. The parcel is designated as Lot 7 on Plate K-11 of the Tax Assessor's maps. Documentation of previous ownership of the land was not located at this office, nor at the Registry of Deeds Office. History of the Hill 78 land parcel was discovered in newspaper clippings dating back to 1931 found in files at GE's EFO Group.

The Hill 78 parcel was once part of the Allen Farm, a 1,250-acre champion horse breeding and training farm established in 1886. After the owner, William Russell Allen, died in 1916, the farm was put up for sale. Several Pittsfield businessmen foresaw the possibilities of GE expansion onto the southern tract of the property, and in 1920 purchased several hundred acres south of Dalton Avenue under the name of the Pittsfield Industrial Development Company. Within six months, GE purchased the tract of land east of Plastics Avenue. In 1927, GE purchased what is now known as the Hill 78 Area, connecting the main plant with the Plastics Division. GE Company began construction of Buildings OP-1 and OP-2 sometime in the 1940s and soil excavated during the construction of these buildings was placed in the Hill 78 landfill area. The City of Pittsfield purchased approximately 12 acres of land north of the Hill 78 Area and began construction of the Allendale School in 1950, which opened in 1951.

3.2 PAST AND PRESENT SITE USES

The Hill 78 landfill within the Hill 78 Area was originally developed for the disposal of excavated soils during construction of Buildings OP-1 and OP-2 in the early 1940s. The landfill was subsequently utilized by GE as a disposal area for plant demolition and construction debris and other solid wastes. Soil boring programs, which are discussed later, indicate that gravel, wood, metal, cement, brick, glass, asphalt, plastic, paper, and ceramic materials have been deposited in the landfill. The landfill is also the depository for snow removed from the entire GE facility in the winter months. The USEPA indicates in the HSWA Permit that in interviews with former employees it was reported that drums containing PCB contaminated soil (fuller's earth) were disposed of in the landfill during the 1950s and 1960s. However, drums were not uncovered during boring programs at the site. From the mid-to-late 1970s to 1990, excavated soils from the facility and non-degradable construction debris containing PCBs at concentrations less than 50 mg/kg were disposed of at the landfill. In 1990, GE discontinued disposal of all solid wastes in the landfill, as directed by the DEP.

Approximately one-fourth of the Hill 78 Area is used for parking for the Ordnance Manufacturing Operations in the OP buildings. These parking areas are paved and bordered by fences or guardrails. Access to the parking areas is restricted to GE employees and contractors.

The Altresco Cogeneration Facility comprises approximately one-fourth of the Hill 78 Area. Preliminary construction of the facility began in 1989, after pre-excavation soil boring programs were completed. This facility consists of four main buildings listed here in decreasing size: the gas turbine generator building, the steam turbine generator building, the cooling tower structure, and the fuel oil tank building. The cogeneration facility produces steam which is piped through above-ground steam lines to provide heat for GE buildings. Six production wells have been installed from 102 to 600 feet below grade at the site to provide cooling water for the cogeneration plant; two of these wells have since been abandoned.

Prior to being used for hazardous waste storage, Building 78 was a gas manufacturing plant which produced industrial gas products (oxygen, hydrogen and nitrogen) used at the GE facility. These gases were transported through underground pipelines to various buildings within the GE plant (Appendix E). On October 23, 1983, GE received approval for construction of outside above-ground storage tanks. In early 1984, industrial gases were delivered to the storage tanks, and gas production ceased in Building 78.

Prior to use as a PCB drum storage facility, GE employees believe that Building 71 was used as a general warehouse. The building was constructed in 1953 with a dirt floor and no heating ducts. In 1979, the structure was refurbished to meet TSCA regulations for storage of PCB-contaminated materials. An aerial photograph (included in Appendix B) taken sometime in 1953 or 1954, shows the site after construction of Building 71 and prior to construction of the Tyler Avenue Extension.

Building 72, which was built in 1967 and demolished in approximately 1988, was the former transformer test site area. Lightning strikes were the primary transformer tests performed in this building, which was located on the site of the present steam turbine generator building. The location of Building 72 and the former transformer test site area is shown on an aerial photograph of the Hill 78 Area taken in 1979 (Appendix B).

Other small buildings on the property include Building 73, Building 14-E and two small guard shacks on the eastern boundary that allow employee access to the OP buildings.

3.3 HAZARDOUS MATERIALS DESCRIPTION

A description of the hazardous wastes stored at Building 78 and Building 71 is included in the Generator Annual Report for 1989 contained in Appendix G. The report lists the types of wastes stored, volumes of wastes shipped off-site, handling codes and hazardous waste transporters used in 1989. In addition, as noted above, excavated soils and construction debris containing PCBs are known to have been placed in the Hill 78 landfill. In recent years, only soils and debris with PCB concentrations less than 50 mg/kg were placed in this area, and that practice was discontinued in 1990.

3.4 HISTORY OF DISPOSAL METHODS

As discussed in Section 3.2, the Hill 78 landfill has been used as a disposal area for construction, demolition materials, excavated soils and from the 1970s through 1990 for debris containing less than 50 mg/kg PCBs. The most common disposal method has been dumping of debris from trucks onto the ground surface.

3.5 HAZARDOUS MATERIAL STORAGE FACILITIES

There are several designated buildings within the Hill 78 Area, three of which store oil or hazardous materials. Building 78 is presently used for hazardous waste storage and is regulated through GE's RCRA Part B Permit. Building 71 is used for PCB drum storage and is regulated through GE's TSCA permit. The Altresco fuel oil tank building stores No. 2 fuel oil in above-ground reserve tanks.

3.6 SUMMARY OF OIL AND HAZARDOUS MATERIALS RELEASES

In addition to the discovery of PCBs in the Hill 78 landfill, documented releases of oil and hazardous material at the Hill 78 Area and vicinity are on file at the DEP. A summary of these reported incidents is presented below. Releases of PCBs to shallow soils at the site have also occurred. Prior investigations of these releases are discussed further in Sections 4 and 5.

Three on-site spills have been documented for the Altresco Cogeneration Plant and are on file at the DEP. In two cases, Clean Berkshires Environmental Remediation Service performed clean up and/or excavation of the contaminated material until clean soil was observed. On October 4, 1990, a spill occurred in the outside bay between the Gas Turbine and Steam Turbine Generator Buildings. Approximately 5 to 10 gallons of non-PCB oil was released into the sump area, which was designed to collect oil and water spills, should they occur. However, the pump to the oil/water separator failed, and the sump overflowed causing the oil to run out of the building and into the ditch alongside the main Altresco entrance. Clean Berkshires placed booms in the ditch, and the spill was contained before reaching the river.

The DEP files indicate that on November 18, 1990, the sump inside the cogeneration plant overflowed again, and 3 to 4 gallons of an oil/water mixture entered the storm drain and were lost. The storm drain system emerges from the ground near the southeastern corner of the Steam Turbine Generator Building, as mentioned previously. Liquids that emerge from this drain line follow a drainage ditch that flows south past Well 78-4, then turns and flows west until it reaches the 30-inch RCP which discharges underneath Merrill Road. This case was closed the same day.

On November 27, 1990, an unspecified amount of No. 2 fuel oil was spilled onto gravel in the bay area while filling an above-ground reserve tank. Clean Berkshires excavated approximately 20 tons of gravel and virgin soil from around the tank and installed a concrete pad to avoid future spills.

One off-site spill was reported approximately 350 feet down-gradient of the Hill 78 Area at Hill's Service Station at 1330 East Street. Reportedly, the service station removed and replaced their underground storage tanks (USTs) on September 4, 1990. Approximately 100-cubic yards of soil were excavated and stock piled from the old tank area. Analysis of this soil indicated the presence of benzene at 0.85 milligrams/gram (mg/g) and xylene at 4.0 mg/g.

4.0 PREVIOUS SOIL INVESTIGATIONS

Numerous soil boring programs were completed between 1987 and 1989 to determine the nature and extent of fill deposits within the site. These included soil borings at the following sub-areas:

- Hill 78 Landfill;
- Altresco Area;
- Altresco Parking Lot;
- Altresco Steamline Supports;
- New York Avenue Water Line; and
- Altresco Transmission Line.

These programs are described in detail and their results are fully presented and discussed in Section 2 of the "Hill 78 Area MCP Phase I Supplemental Data Summary" (Blasland and Bouck May 1990), which is included in full as Appendix A to this report. That Supplemental Data Summary is incorporated by reference herein.

5.0 PREVIOUS GROUND-WATER INVESTIGATIONS

5.1 NEW YORK AVENUE WATER LINE WELLS

A ground-water investigation was conducted at the Hill 78 Area in 1988. This investigation involved the installation and sampling of four shallow monitoring wells, referred to as the New York Avenue wells, at the northern and southern boundaries of the western side of the site.

Four wells (NY-1 through NY-4) were installed on the western side of the Hill 78 Area during the period of April 25 through May 3, 1988. Boreholes were completed by Soil and Material Testing, Inc. of Castleton, New York, using the hollow-stem auger method. Geologic logs and well construction details for these wells are included in Appendix H. These wells were then sampled and the ground-water samples analyzed. Quantifiable levels of zinc at 0.022 ug/L and phenols at 0.73 ug/L were detected in Well NY-1. Zinc was also detected in Wells NY-3 (0.036 ug/L) and NY-4 (0.006 ug/L). Cyanide was detected in Well NY-2 at a concentration of 0.73 ug/L. One composite soil sample from Well NY-1 (0-8 feet boring depth) was analyzed by GE and indicated a PCB concentration of 1 mg/kg. Further details regarding the results of this sampling and analytical effort are provided in Section 3 of the "Hill 78 Area MCP Phase I Supplemental Data Summary" (Appendix A).

5.2 ALTRESCO SUPPLY WELL

On two previous occasions, January 11, 1989 and August 10, 1989, ground-water samples were collected from Altresco Supply Well #3 (ASW-3) and analyzed for the complete list of priority pollutants. The results of these analyses showed detectable concentrations of toluene at 150 ug/L and zinc at 17 ug/L in the January 1989 ground-water sample, and trichloroethene at 4 ug/L and copper at 40 ug/L in the August 1989 ground-water sample. ASW-3 is a bedrock well which extracts water from a depth of approximately 439 feet below grade.

6.0 SCOPE OF MCP PHASE I FIELD INVESTIGATION

GE's proposal for the Phase I - Limited Site Investigation of the Hill 78 Area was presented in the "Hill 78 Area MCP Phase I Scope of Work", submitted to the DEP in August 1990. That Scope of Work was also submitted to the USEPA. By letter to GE of November 7, 1990, the DEP approved that Scope of Work subject to certain conditions. As approved, the Phase I Scope of Work called for installation of seven new ground-water monitoring wells at the site, sampling and analysis of soil samples collected during well installation, sampling and analysis of ground water from the seven new wells plus five existing wells, sampling and analysis of the surface water and sediments from two locations in the intermittent stream at the site, inclusion of this area in GE's facility-wide air monitoring program for PCBs, and visual reconnaissance and review of prior information to assess evidence of releases of hazardous materials. Between January and May 1991, Geraghty & Miller carried out the Phase I field investigations called for in the approved Scope of Work for the Hill 78 Area. These field activities are described below.

6.1 MONITORING WELL INSTALLATIONS

A total of seven shallow to intermediate depth ground-water monitoring wells were installed in the Hill 78 Area during the period of January 2 through 10, 1991 (Figure 1). The new wells, designated 78-1 through 78-7, were constructed to bridge the water table in order to detect the possible presence of free-floating fluid phases, and to assess ground-water quality at the site.

At each well location, soil sampling was completed in accordance with the DEP-approved Sampling and Analysis Plan dated September 1990. Continuous split-spoon soil samples were collected on 2-foot intervals and described by the on-site geologist for moisture content, sediment texture and structure. Soil borings for the monitoring wells were advanced to a depth of approximately 10 feet below the apparent water-table by the hollow-stem auger method. Soil samples were field-screened for the presence of VOCs using a portable photoionization detector (PID). The PID results are presented in Table 3, and soil boring logs and well construction logs are presented in Appendix H.

Each 2-foot soil sample was submitted to IT Analytical Laboratories in Knoxville, Tennessee, for PCB analysis by USEPA Method 8080. Soil samples that produced a headspace reading above background were submitted to CompuChem Laboratories of Research Triangle Park, North Carolina, for VOC analysis and semi-volatile organic compounds (SVOCs) analysis by USEPA Method 8240.

A quality assurance/quality control (QA/QC) program was followed to ensure the quality of both field and laboratory data collected during the field investigation. Refer to the Sampling and Analysis plan by Blasland & Bouck Engineers, P.C., September 1990, for a detailed discussion of the program. A general summary of QA/QC procedures followed in the field is provided below. Duplicate soil samples were taken at the frequency of one per twenty (1/20) samples collected for VOC and PCB samples. In addition, one matrix spike and matrix spike duplicate (MS/MSD) soil sample from the Hill 78 Area was submitted for analysis of VOCs, and two for PCBs.

Wells were constructed using 4-inch diameter Schedule 40 PVC casing, with 15 feet of 0.010-inch slotted screen. A well-sorted sand pack was placed in the annular space to 2 feet above the screen. A 2-foot thick bentonite pellet seal was placed above the sand pack, and the remaining annular space was grouted to land surface with a cement/bentonite mix. A locking curb box was installed to complete the well. A summary of the well construction details is presented in Table 4.

Upon completion, each well was thoroughly developed to ensure a good hydraulic connection between the screen zone and the surrounding formation. Well development was performed by Clean Berkshires, Inc. of Lanesboro, Massachusetts, using an air-lift pump to develop the well until visibly sediment-free water was produced.

6.2 GROUND-WATER SAMPLING AND WATER-LEVEL MEASUREMENTS

Between January 22 through 24, and on February 28, 1991, ground-water samples were collected from the seven newly-installed wells (78-1 through 78-7) and from five existing wells on site (NY-1 through NY-4, and the number 3 supply well within the Altresco building).

A depth to water measurement was taken upon opening the wells, and approximately three to five well volumes were purged from each well prior to sampling. At Well 78-7, Well NY-1 and Well NY-2, a sample was collected from each well, using clean Teflon bailers, for analysis for the constituents in Appendix IX of 40 CRF Part 264, plus three additional constituents (benzidine, 2-chloroethyl vinyl ether and 1,2-diphenylhydrazine) (Appendix IX + 3). Ground-water samples from all other well locations were also analyzed for Appendix IX + 3 parameters, except pesticides and herbicides. Water-level elevation data are presented in Table 5. Field measurements of specific conductivity, pH and temperature were recorded as each well was sampled (Table 6).

Water samples were chemically preserved, when necessary, and packed in iced coolers with a completed chain-of-custody form for shipment to the laboratory. The samples were analyzed by CompuChem Laboratories.

QA/QC procedures were followed as outlined below. For the Hill 78 Area, one Appendix IX + 3 water sample was collected and submitted for each of the following: one duplicate; one MS/MSD; and one field equipment blank for Appendix IX + 3 analysis. In addition, one trip blank was included with each days shipment, for a total of four.

6.3 SURVEYING OF WELL LOCATIONS

The measuring-point elevations of the newly-installed monitoring wells were determined to the nearest hundredth of a foot, in relation to mean sea level, by a licensed land surveyor. The locations of the wells are shown on Figure 2, and the survey information is presented in Table 4.

6.4 SURFACE-WATER AND SEDIMENT SAMPLING

Surface-water and sediment samples were collected from two locations (S-1 and S-2) within the stream located in the south-central portion of the Hill 78 Area. Sediment samples were collected with Lexan tubing to prevent disturbance of the sediments. Surface-water samples were analyzed by CompuChem Laboratories for Appendix IX + 3 parameters. The chain of custody for the sediment samples also listed analysis for Appendix IX + 3 constituents. However, CompuChem Laboratories improperly identified the analytical parameters to be analyzed for and only analyzed for VOCs and SVOCs. To rectify this error, two additional sediment samples will be collected from the same locations and analyzed for Appendix IX + 3 parameters, excluding VOCs and SVOCs. These results will be provided separately to the DEP and USEPA in the future as a supplemental report.

6.5 AIR MONITORING PROGRAM

The MCP Scope of Work for the Hill 78 Area provided that this area would be included in GE's Facility Air Monitoring Program (described in a separate Scope of Work). As applicable to the Hill 78 Area, that program involves the performance of one year of ambient air monitoring to quantify levels of PCBs emanating from the site and to downwind receptors. Based on a siting analysis, an ambient air monitoring station at the Hill 78 Area was included in the air monitoring network. A summary of the activities for the Hill 78 Ambient Air Monitoring Project as of August 22, 1991, follows:

- Network design approval for PCB sampling locations was approved by the DEP in June 1991.

- A meteorological station was installed in July 1991 on the Hill 78 Area and is operational.

- A final Quality Assurance Plan for PCB sampling programs, which defines data quality objectives, quality assurance objectives and standard operating procedures, was delivered to the DEP on August 22, 1991.

- The year long PCB sampling program began on August 20, 1991. Samples in the Hill 78 Area will be collected every 12 days.

The results of the year long Ambient Air Monitoring Project will be submitted as part of the Facility Air Monitoring Program Report.

7.0 RESULTS OF MCP PHASE I INVESTIGATION

7.1 SITE GEOLOGY AND HYDROGEOLOGY

Recent soil borings completed at the GE facility and vicinity by Geraghty & Miller indicate that well to poorly sorted stratified deposits (sand, silt and gravel with trace clay) overlie heterogeneous till composed of silt, sand, gravel, and boulders with abundant clay. Till, which generally occurs as a discontinuous layer over bedrock, was observed at 39 feet below grade in East Street Area 2 (January 1991), and at 228 feet below grade within the Unkamet Brook area (March 1991).

Soil borings installed at the Hill 78 Area prior to the MCP investigation (Appendix H) indicate a predominance of sand in the upper 28 feet (deepest boring) of overburden. The sand is generally brown, grey, olive or red in color and ranges in grain size from fine to coarse, and ranges in sorting from poor to well sorted. Fine to coarse gravel of angular to rounded shape and poor to well sorting was the second highest constituent observed in the Hill 78 soil borings (Appendix H). Low percentages of manmade fill material (paper, cellophane, brick, plastic, and coal) were observed in borings 78-4 (0-2 feet), 78-6 (6-8 feet) and 78-7 (0-6 feet and 14-16 feet). Slight black staining on sand was observed in borings 78-2 (8-10 feet), and 78-4 (4-6 feet), although oil or chemical odors were not observed during drilling. Black, organic, peat moss-like material was observed in borings 78-1 (4-6 feet) and 78-6 (12-14 feet).

Depth to bedrock varies from 60 to 90 feet based on the geologic logs for the Altresco cooling water supply wells (Appendix H). At each well location, a thick sequence of grey-brown till (up to 40 feet) overlies the bedrock surface. The bedrock encountered was primarily a dolomitic marble with occasional layers of quartzite and sandstone.

Water-level measurements at the Hill 78 Area indicate that depth to groundwater ranges from 3 to 15 feet below grade in the winter (January and February 1991 measurements) and 5 to 19 feet below grade during the summer (July 1991 measurements) (Table 5). The direction of ground-water flow is generally south towards Merrill Road and the Housatonic River, perpendicular to the ground-water contour lines (Figures 3 and 4). In general, ground-water flow patterns in January and July 1991 were similar. Specific ground-water flow patterns around the landfill in January and July are more difficult to infer. The high water table elevation observed in Well 78-6 and the marshy areas between the landfill and Tyler Street Extension and the southeastern border of the Allendale School property, suggest that ground water is mounding in this area. This may be related to inadequate drainage in the area, and pooling of water in the swale behind the landfill and at the southern end of the Allendale School property near Well 78-6.

7.2 HEADSPACE SCREENING RESULTS

The results of PID readings from the headspace screening of soil samples are presented in Table 3. Only three soil boring locations, 78-1, 78-4 and 78-6, had PID readings above 0.0 parts per million (ppm) (background).

The highest reading (39.4 ppm) was observed in soil boring 78-1 (12 to 14 feet). This was the only reading above background at that location. Soil boring 78-6 also only had one reading above background which was 6.1 ppm in a sample collected from 10 to 12 feet. Five readings were observed above background in samples from soil boring 78-4 with a high reading of 2.4 ppm from 4 to 6 feet. Consequently, samples from 78-1 (12 to 14 feet), 78-4 (4 to 6 feet) and 78-6 (10 to 12 feet) were submitted for analysis of VOCs and SVOCs.

7.3 SOIL ANALYTICAL DATA

The analytical data results of soil samples submitted for laboratory analysis of VOCs, SVOCs (including 1,2,4-trichlorobenze) and PCBs are summarized in Tables 7, 8, and 9, respectively. For the VOC and SVOC results, only those compounds that were detected in one or more samples are shown in Tables 7 and 8. All laboratory analytical reports showing all the data, including detections limits and quality control information have previously been submitted to the DEP and the USEPA.

The VOC and SVOC analysis of soil samples from soil borings 78-1, 78-4 and 78-6 detected only bis(2-ethylhexyl)phthalate above the detection limit, at a concentration of 1.3 milligrams per kilogram (mg/kg) in the sample from 78-4 (12 to 14 feet). Although acetone and methylene chloride were also detected in each of the soil samples submitted, both compounds were also detected in the associated method blanks at similar concentrations, and are common laboratory contaminants. The presence of the two compounds in both the method blank and sample at similar concentrations indicates that the sample result is due to laboratory contamination during preparation of the sample for analysis.

A summary of total PCBs (Aroclors 1016, 1232, 1242, 1254, and 1260) detected in soil samples is presented in Table 9. The highest PCB concentrations were detected in soil samples collected from soil boring 78-7, located directly adjacent to the landfill along its southwestern border (Figure 2). PCB concentrations were detected at 5.30 mg/kg in a soil sample from 0 to 2 feet, with PCB concentrations increasing to 780 mg/kg in a sample from 2 to 4 feet. Concentrations ranged from 210 mg/kg to 58 mg/kg in samples from 4 to 12 feet and were less than 2 mg/kg in samples from 12 to 28 feet.

PCB concentrations at each of the other soil boring locations were detected at significantly lower concentrations than at 78-7 and at depths typically less than 8 feet. Only two samples, one from 0 to 2 feet in 78-4, and the other a duplicate sample, DP-3, from 4 to 6 feet also at 78-4, contained PCBs greater than 2.0 mg/kg.

7.4 GROUND-WATER ANALYTICAL DATA

The analytical results of ground-water samples collected from the 11 on-site monitoring wells and the Altresco Supply Well #3 are summarized in Tables 10, 11, 12 and 13. Only those compounds detected in one or more samples are included in these tables. Laboratory analytical reports containing the sample data packages, including detection limits and quality control raw data, have previously been submitted to the DEP and the USEPA.

Results of the VOC analysis of ground-water samples (Table 10) indicate that VOCs were detected in only three of the monitoring wells, Wells 78-4, 78-7, and NY-4. Total VOC concentrations were highest at Well 78-4 (approximately 580 micrograms per liter [ug/L]) which included trichloroethene detected at 320 ug/L, 1,2-dichloroethene (total) at 180 ug/L and vinyl chloride at 23 ug/L. 1,2-dichloroethene was detected in Well NY-4 at a concentration of 180 ug/L and trichloroethene was detected in Well 78-7 at 5 ug/L. No VOCs were detected in the New York Wells during the 1988 sampling round; however, only trans-1,2-dichloroethene was analyzed for during that sampling round, whereas 1,2-dichloroethene (total) was analyzed for during the MCP Phase I sampling round. In addition, no VOCs were detected in trip blank samples (TB1, TB2, and TB3), the duplicate sample from Altresco Supply Well #3 (DP-1) and the field blank sample taken after sampling Well 78-1 (FB-1) as part of the QA/QC program.

SVOC concentrations detected in ground-water samples are presented in Table 11. As shown in Table 11, only phenols were detected at concentrations of 10.4 ug/L in Well 78-1 and 45.9 ug/L in Well NY-1. The phenol concentrations given represent a total concentration of phenolic compounds in the samples. Other SVOCs were non-detect or reported as estimated concentrations, less than the sample detection limit. Phenols were also detected in a sample from Well NY-1 during the 1988 sampling round at a concentration of 75 ug/L.

The analysis of dioxin and furan compounds indicated less than detectable concentrations in each of the wells except Well NY-1. As shown in Table 12, several dioxin and furan compounds were detected in Well NY-1 at concentrations ranging from 1.40 nanograms per liter (ng/L) of pentachlorodibenzofurans to 83 ng/L of octachlorodibenzodioxin.

The pesticide and herbicide analysis of ground-water samples from Wells 78-7 and NY-2 revealed non-detect concentrations of pesticides and herbicides. PCBs were detected in each of the ground-water samples (including the field blank [FB-1] and a duplicate sample [DP-1] from Altresco Supply Well #3) with the exception of Well NY-2. PCB (Aroclor 1260) was detected in Well NY-2 at a concentration of 0.63 ug/L.

A summary of metals and total sulfides in ground-water samples is provided in Table 13. Nearly all of the samples contained varying concentrations of calcium, magnesium, manganese, and sodium.

7.5 SURFACE-WATER AND SEDIMENT ANALYTICAL DATA

The analytical results of surface-water and sediment samples collected from the small stream on-site are summarized in Tables 14 and 15 (which, again, include only those constituents detected in at least one sample). The complete analytical results of the surface-water and sediment sampling are included in the laboratory reports which have been previously been submitted to the DEP and the USEPA.

The results of the analyses for VOCs and SVOCs (Table 14) show that, at location S-1, the only compound detected in the surface-water sample (SW-1) (apart from methylene chloride, which was also found in the blank) was phenols at a concentration of 11,200 ug/L. At that location, no VOCs or SVOCs were detected in the sediment sample (SE-1). At location S-2, the only compound detected in the surface-water sample (SW-2) (apart from the compounds also found in the blank) was alpha-BHC at a concentration of 0.031 ug/L, and the compounds detected in the sediment sample (SE-2) were fluoranthene at 38.0 mg/kg and pyrene at 28.0 mg/kg. PCBs were not detected in either surface-water sample.

A summary of metal concentrations in the two surface-water samples is presented in Table 15. Compounds detected in both samples included calcium, iron, magnesium, manganese, and sodium at concentrations comparable to those observed in ground-water samples (Table 13) and typical of ambient water quality in the area (Table 2).

It should be noted that, as discussed in Section 2.2 above, the water in this swale flows from a drainage pipe to which there are no contributions on GE's property. Hence, the constituents found in this water do not appear to be attributable to GE sources.

8.0 ADDITIONAL SOIL SAMPLING FOR ALTRESCO LANDSCAPING

On February 1, 1990, the DEP conditionally approved, as an interim measure, a proposal by HMM Associates. Inc., on behalf of Altresco, to plant trees at and around the Hill 78 Area. In connection with that interim measure, a soil sampling program was carried out. On April 12 through 13, 1990, a total of 25 soil borings were drilled in the Hill 78 Area and vicinity at proposed tree locations and landscaping areas to determine the presence of PCBs in soil. Soil boring locations and sampling procedures are described in the April 30, 1990 Geraghty & Miller letter report (Appendix I). This program was separate from GE's Phase I - Limited Site Investigation of this area.

At each boring location, split-spoon samples were collected at two-foot intervals to depths of 4 to 10 feet below grade. Soil samples from each interval were screened for VOCs using a PID and then submitted for laboratory analysis of PCBs. The analytical results, presented in the laboratory report in Appendix I, indicated detectable concentrations of PCBs at only three of the soil boring locations, L5, L7, L8, and the Altresco meter pit near Building 78. Soil borings L5, L7, and L8 are located south of the Altresco Cogeneration Facility, with soil borings L7 and L8 located in the vicinity of Well 78-4. PCB concentrations were highest in soil boring L-7 with concentrations of 1,000 mg/kg in a sample from 2 to 4 feet and 840 mg/kg from 0 to 2 feet. In soil boring L8, PCBs were detected at 1.8 mg/kg in the 0 to 2 feet sample and 33 mg/kg in the 2 to 4 feet sample. PCBs were detected in L5 (0 to 2 feet) at 4.6 mg/kg. At the Altresco meter pit, a sample from 0 to 2 feet contained 34 mg/kg PCBs and a sample from 2 to 6 feet contained 2.3 mg/kg PCBs.

The interim measure required that for any sampling location with PCB concentrations greater than 2 mg/kg that the trees must be installed above grade in a berm.

9.0 SHORT-TERM MEASURES

9.1 COVER FOR HILL 78 LANDFILL

On September 14, 1990, GE submitted a letter and plan entitled "Hill 78 Cover Plan" to the DEP in response to the Department's request for a STM to cover the 3.5-acre Hill 78 landfill area. On March 22, 1991, the DEP approved the proposal subject to certain conditions. Under this proposal as approved, the cover was required to be constructed in accordance with the following specifications:

1. A geotextile layer would be placed over the relatively flat top portion of the landfill.

2. A one-foot thick crushed stone layer would be placed over the geotextile layer, compacted to a density greater than 90%, and graded so that the surface of the stone slopes slightly to the west.

3. Fill and topsoil material to be placed on the cap must be approved by the DEP.

4. Side slopes would be capped with a minimum of one foot of clean fill (including 6 inches of topsoil), compacted, graded to a 1:3 slope, and hydroseeded.

Installation of the cover was completed in August 1991 in accordance with these specifications. A copy of a topographic map of the completed cover is included in Appendix C.

9.2 EVALUATION OF NEED FOR OTHER SHORT-TERM MEASURES

The DEP's conditional approval letter of March 22, 1991, for the Hill 78 landfill cover stated that GE's MCP Phase I Report on the Hill 78 Area must be accompanied by a report "evaluating any remaining surficial PCB soil contamination at the site [following the completion of the Hill 78 cover and of the HMM landscaping referred to in Section 8 above] and the need to perform any additional interim or short term measures addressing it." Such an evaluation has been carried out and the results are reported in this section (rather than in a separate report).

To evaluate the remaining surficial PCB soil contamination in the vicinity of the Hill 78 landfill and the need for other STMs, a total of 10 surface soil samples were collected in August 1991 from depths of 0 to 6 inches at locations shown on Figure 5. The analytical results of these samples, which are presented in the laboratory report in Appendix J, show a range of PCB concentrations from less than 0.7 mg/kg (samples C3, C4, C5, and C8) to 9.7 mg/kg at C9. These concentrations do not constitute an imminent threat to public health or the environment and therefore additional STMs for the Hill 78 landfill are not required. Given the fact that the Hill 78 Area is located within an operating industrial facility with strictly limited access to GE employees and its contractors (i.e., no public access), these concentrations do not constitute an "imminent hazard" within the meaning of the MCP. Therefore, based on these data, it is concluded that additional STMs for the surficial soil at the Hill 78 Area are not required.

10.0 SOURCE CHARACTERIZATION

10.1 HILL 78 LANDFILL

As described in Section 3.2, the Hill 78 landfill has been used for disposal of excavated soil, construction and demolition debris since the 1940s. The USEPA HSWA permit references interviews with former employees who indicated drums potentially containing PCBs (likely adsorbed by fuller's earth) may have been placed in the landfill in the 1950s and/or 1960s. From the mid-to-late 1970s to 1990, the landfill was used for the disposal of non-degradable construction debris and excavated soils (from the Pittsfield facility) with PCB concentrations less than 50 mg/kg. The landfill is no longer used for solid waste disposal. During the Visual Site Inspection (VSI) by the USEPA it was reported that petroleum odors were present within the 3.5-acre landfill. Soil samples collected during a soil boring program in 1987 have confirmed the presence of PCBs in the landfill. As discussed in section 9.1 above, the Hill 78 landfill is now covered.

Insufficient data exists to determine an accurate volume of PCB-contaminated material within the landfill. An estimated volume of PCB-contaminated material within the landfill, based on the geometry of the landfill during the April 1987 soil boring program, is roughly 48,500-cubic yards, depending on the depth of PCB-contaminated fill material. The soil borings drilled in the landfill were completed to a maximum depth of 20 feet, not to the bottom of fill or beyond the depth of PCB-contaminated material. The calculations were made assuming the shape of PCB-contaminated material as a cylindrical cone, where $V = 1/3\pi r^2 h$ (r = radius of PCB-contaminated material from center of landfill, 250 feet, h = depth of PCB contaminated material, 20 feet).

10.2 OTHER POTENTIAL SOURCES IN AREA

Building 71 Stormwater Drain Line

Building 71 was constructed in 1953. It was used as a storage building until 1979 when it was reconstructed in accordance with provisions of CRF 761.65 to store drums of PCB contaminated materials. The reconstruction consisted of replacing the concrete floor, installing berms and sealing the floor. No floor drains were installed. In 1979, a 26,000-gallon tank was installed in a diked area near Building 71 and was used to collect PCB-contaminated oil pumped from tankers and drums in Building 71. The dike contained a sump used to collect stormwater and a locked manual valve to drain stormwater that collected in the sump. Prior to discharging water from the sump, a sample was collected and analyzed for PCBs. Only after the analytical results were known was the sump drained into a stormwater catch basin. In about 1983 or 1984, the tank was removed and the dike was cleaned. This eliminated any potential stormwater contamination.

Oil Transfer Lines

As described in Section 2.5, pipelines were used to transfer 10C oil from Building 12F to Building 51. The pipelines run parallel to the Tyler Street Extension in the Hill 78 Area. Transfer of the 10C oil in the pipelines was discontinued in about 1964. The pipelines were subsequently drained at the lowest point in the Hill 78 Area.

11.0 OVERALL CHARACTERIZATION OF HAZARDOUS MATERIALS AT SITE

The MCP Phase I investigation has identified hazardous materials that occur in both the soil and ground water at the Hill 78 Area. The physical and chemical nature of these materials, estimated volumes of contaminated material, and general fate and transport characteristics are described below.

11.1 NATURE AND PHYSICAL AND CHEMICAL CHARACTERISTICS OF CONTAMINANTS

Hazardous materials detected in soil and ground water at the site are primarily PCBs, with more isolated occurrences of VOCs and SVOCs. In one monitoring well ground-water sample dioxins and furans were detected.

PCBs have been detected in shallow soils throughout the site and at one ground-water monitoring well location (Well NY-2). There is an abundance of literature pertaining to the chemical and physical characteristics of PCBs. Chemically, PCBs are formed by linking two benzene rings with a covalent bond between the two carbon atoms to form a biphenyl molecule, and then substituting chlorine atoms for hydrogen atoms to form a chlorobiphenyl molecule. PCBs were manufactured in the United States by Monsanto Chemical Company and marketed under the trade name Aroclor. Because of their physical and chemical characteristics, PCBs were used in transformers, capacitors, hydraulic fluids and paints. These same properties make PCBs very stable and highly persistent in the environment. PCBs have only limited solubility in water (ranging from 0.007 to 5.9 ng/L), and have a strong affinity for soils and sediments.

Table 16 presents some of the physical and chemical characteristics of PCBs and VOCs. The solubility, specific gravity, octanol/water partition coefficient, vapor pressure and selected physical characteristics of each compound are shown. The octanol/water partition coefficient (K_{ow}) is a measure of the relative affinity of a compound for an organic versus an aqueous media; K_{ow} is often expressed as a logarithm (log K_{ow}).

Whereas PCBs have a strong affinity for soil organic material (as evidenced by a K_{ow} of up to 7.14) and are relatively non-volatile, halogenated aliphatic hydrocarbons such as 1,1,1-trichloroethane and 1,2-dichloroethane are moderately to highly volatile and are not as readily absorbed into soils. Many VOCs are only slightly soluble in water, ranging from 150 mg/L (tetrachloroethene) to 6,000 mg/L (1,2-dichloroethene).

Other hazardous materials detected at the site include dioxins, furans and phenols. Dioxins are a group of aromatic hydrocarbons known as di-benzo-p-dioxins. Dioxins are only slightly soluble in water (0.2 ug/L) and quite stable in the environment. Although much is known about the toxicity of the dioxin isomer 2,3,7,8-TCDD, there is currently some controversy regarding the toxicity of dioxins and proposed regulatory levels (Hansen 1991). Both dioxins and furans have been detected in emissions from municipal incinerators (Cheremisinoff 1990). Furans are also a common by-product of combustion processes at manufactured gas plants. Solubility of furans in water is 10,000 mg/L at 25°C.

Phenols detected on site (Table 11) potentially represent the total concentration of several different phenolic compounds. Each of these isomers has differing physical and chemical characteristics, but in general phenols are slightly soluble (14 - 800 mg/L), and do not readily volatilize.

11.2 ESTIMATED VOLUMES OF CONTAMINATED MATERIAL

Insufficient data exists to determine an accurate volume of PCB-contaminated soil for the Hill 78 Area. Estimated volumes of PCB-contaminated material were calculated for areas of the site subject to previous soil boring programs. The volumes listed below are estimates due to the fact that soil borings did not define the lateral or vertical extent of contamination in these areas.

Area	Estimated Volume of PCB-Contaminated Material
Hill 78 landfill	48,500-cubic yards
Altresco Area	11,000-cubic yards
Altresco Parking Area	270-cubic yards
Altresco Steamline Supports	8,600-cubic yards
New York Avenue Water Line	1,100-cubic yards
Altresco Transmission Line	1,250-cubic yards

Although chemical compounds have been detected in ground water at the site, there is insufficient data at the present time to determine the volume of ground water which may be potentially impacted.

11.3 FATE AND TRANSPORT CHARACTERISTICS

The high octanol/water partition coefficient of PCBs results in PCBs having a high affinity for soil and sediment organic material, and a relatively low potential for leaching into ground water. From the MCP Phase I sampling results, the absence of PCBs in Well 78-7, located directly adjacent to the Hill 78 landfill, and the finding of only 0.63 ug/L in Well NY-1 indicate that PCBs at the Hill 78 Area are adhering to the soil. PCBs are highly persistent due the their stability in the environment, although recent studies on PCBs in the Hudson River, Housatonic River and Silver Lake indicate that PCBs are subject to biodegradation.

For most of the VOCs detected at the Hill 78 Area adsorption to soil organic matter is of limited importance in affecting transport in ground water. Both the VOCs and SVOCs are biodegradable; however, the degradation processes are typically much more rapid under aerobic conditions. Within an aquifer, oxygen-deficient or anaerobic conditions are normally present.

The rate of migration of dissolved constituents in ground water is proportional to the hydraulic gradient across the site and permeability of the saturated soils. At present, the rate of migration of dissolved constituents and the possible existence of vertical flow gradients at the site have not been determined. The analytical results of the MCP Phase I sampling round do not indicate significant VOC, SVOC and PCB concentrations in ground water.

12.0 MIGRATION AND EXPOSURE INFORMATION

This section describes the potential migration pathways for hazardous materials detected at the Hill 78 Area.

12.1 POTENTIAL MIGRATION PATHWAYS

Potential migration pathways for hazardous materials found at the Hill 78 landfill include the vertical movement of infiltrating recharge through the landfill to the ground water, and airborne transport of material from the surface of the landfill. However, the landfill cover completed in August 1991 will reduce infiltration of water and prevent airborne migration of hazardous materials from the landfill surface. The production and subsequent migration of subsurface gas is not likely due to the types of materials disposed of in the landfill (e.g., construction debris, wood, metal, plastic, excavated soil) as opposed to municipal refuse. The storm drain and sanitary sewer, which run beneath the western edge of the landfill, at a depth of 25 to 30 feet, would also serve as a potential migration given the possibility for infiltrating water to enter the pipes.

Other potential migration pathways include the movement of dissolved constituents in ground water beneath the site and traction transport by vehicles. Ground-water discharge to the intermittent stream would serve as a migration pathway via surface water. Traction transport of surficial soils containing PCBs or other hazardous material from the landfill has been eliminated with the placement of 1 foot of stone on the surface of the cap.

12.2 IDENTIFICATION OF POTENTIAL HUMAN AND ENVIRONMENTAL RECEPTORS

Based on existing information and site conditions, as well as foreseeable use of the site, potential human exposure to PCBs or other hazardous materials detected at the Hill 78 Area is limited to workers involved in excavation of soils during construction projects and workers involved in other operations around the Hill 78 Area grounds. As previously noted, the cover for the Hill 78 landfill prevents air-borne migration and contact with PCBs, thereby limiting human exposure to hazardous materials in the surficial soils at the site. A review of DEP's "Water Supply Protection Atlas" and interviews with GE personnel have indicated that public or private potable water supply wells are not located in the vicinity of the site, and that consequently there is no apparent risk of drinking water supplies being adversely impacted by ground-water conditions at the Hill 78 Area. The single potential environmental receptor appears to be the intermittent stream on-site. Although the concentrations of SVOCs and pesticides are relatively low, the possibility exists that wildlife in the area may use the stream as a water source. As previously discussed, there are no endangered species, critical habitats or wetlands on-site which would be considered potential receptors.

12.3 IDENTIFICATION OF EXPOSURE POINTS AND POTENTIAL ROUTES OF EXPOSURE

The identification of exposure points at the Hill 78 Area is based on recent and historical analytical results of samples collected at the site and on present and reasonably foreseeable land use of the site. The site is part of an active, operating, access-restricted facility and is likely to remain so for the foreseeable future, and there is no current or foreseeable use of ground water at the site for drinking water or other water supply purposes. In these circumstances, it is highly unlikely that any human or other receptors could be exposed to deep subsurface soils or ground water at this site. Hence, those media are not considered to include significant exposure points. The exposure points considered are thus limited to surficial soils, excavated soil, and the surface water and sediment of the small, intermittent on-site stream. The potential routes of exposure for these exposure points are as follows:

Exposure Point	Potential Routes of Exposure
Surficial soils (less than approximately 6 inches), excavated soils (generally less than a depth of 8 to 10 feet) throughout the site, and soil boring cuttings	Dermal contact; ingestion, fugitive dust inhalation; direct contact with the medium containing the compound
Surface-water and sediment in stream	Dermal contact; ingestion

It should be emphasized that these exposure points are not ones to which anyone will be exposed to on a regular basis. Potential human exposures are limited to on-site workers and contractors who might occasionally encounter the contaminated material in the course of well drilling, excavation/construction work or other operations at this site. Moreover, workers who could be exposed to excavated soils containing elevated concentrations of PCBs or other hazardous materials would be required to wear appropriate protective equipment and take appropriate precautions to prevent contaminant transport or release.

13.0 SUPPLEMENTAL INVESTIGATIONS

This section describes supplemental sampling and analytical activities that GE is conducting to obtain information to address certain data gaps noted in the Phase I investigation. The results of these activities will be submitted to the DEP and USEPA in supplemental reports. Any other remaining data gaps in the information relating to the Hill 78 Area will be addressed in GE's Scope of Work for a Phase II Comprehensive Site Assessment for this area.

13.1 SOILS

Due to the presence of dioxin and furan compounds detected in Well NY-1, GE installed a soil boring near Well NY-1 to determine if dioxin and furans were present in the overlying soils. The soil boring (NY-5) was installed on July 10, 1991 and soils were sampled continuously with a split-spoon sampler. Based on PID screening of the soil samples, a sample from 14-16 feet was submitted for Appendix IX+3 analysis. The results of the soil sample will be submitted to the DEP and USEPA in a supplemental report.

13.2 GROUND WATER

On August 29, 1991, Well NY-1 was resampled for dioxin and furan compounds. The resampling was performed to verify the previous analytical results and to confirm the presence of dioxin and furan compounds. Two ground-water samples were collected from the well with one sample submitted to CompuChem Laboratories, and the other sample submitted to IT Analytical Services. The analytical results will be included in a supplemental report with the results of soil boring NY-5.

13.3 SURFACE-WATER AND SEDIMENTS

As described in Section 6.4, only VOCs and SVOCs were analyzed in the sediment samples from the on-site stream. To obtain data on the remaining Appendix IX constituents, GE will collect sediment samples from the same locations in the stream and analyze the samples for Appendix IX + 3 parameters, excluding VOCs and SVOCs. The results will be presented in the same supplemental report which will include the analytical results from the soil and groundwater samples described in Sections 13.1 and 13.2

13.4 AIR

Results of the on-going PCB air monitoring program for the Hill 78 Area will be provided on a quarterly basis and a final report will be submitted in June 1992.

14.0 CONCLUSIONS

Based on the foregoing information and given the nature of the Hill 78 Area as part of an operating access-restricted industrial facility, GE does not believe that this site presents any significant threat to human health or the environment. An Interim Site Classification Form evaluating the criterion for whether this site should be classified as a priority or non-priority disposal site under the MCP (310 CMR 40.544) is included in Appendix L. That form indicates that the site does not meet the criteria for classification as a priority disposal site, with the exception of the criteria relating to air emissions, for which the necessary data do not now exist and will be gathered in the Facility Air Monitoring Program.

Pursuant to Paragraph 7.3 of the July 2, 1990 consent order between GE and the DEP, a Scope of Work for a Phase II Comprehensive Site Investigation of the Hill 78 Area will be submitted to DEP within the later of: (a) 30 days after the DEP notifies GE of a classification decision for this site as a priority or non-priority disposal site; or (b) 90 days after the DEP notifies GE of its approval or modification of this Phase I report. GE also intends to submit that Scope of Work to the USEPA as its proposal for the additional investigations necessary in the Hill 78 Area as part of the RFI under the RCRA corrective-action permit issued by the USEPA.

15.0 REFERENCES

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Table 1. Summary of Previous Investigations Conducted at the Hill 78 Area, May 1987 through November 1990, GE Company, Pittsfield, Massachusetts.

Author	Investigation Title/Location	Date of Report
Geraghty & Miller, Inc.	Building 78 Soil Boring Program	May 26, 1987
Geraghty & Miller, Inc.	Building 72 Soil Boring Program	July 30, 1987
Geraghty & Miller, Inc.	Hydrogeologic Investigation at the New York Avenue Sites	June 1988
Geraghty & Miller, Inc.	Building 72 Soil Boring Program Conducted on August 8, 1988	August 29, 1988
Geraghty & Miller, Inc.	Results of the Soil Boring Program Conducted in the Vicinity of the Altresco Steamline	June 30, 1989
Geraghty & Miller, Inc.	Soil Boring Data for the New York Avenue Water Line Project	November 13, 1989
Geraghty & Miller, Inc.	GE/Altresco Strain Pole Boring Program	December 21, 1989
Geraghty & Miller, Inc.	GE/Altresco New York Avenue Water Line Project	December 21, 1989
Geraghty & Miller, Inc.	Soil Boring Investigations, Altresco Cogeneration Site (Includes reports for six separate boring programs from April 1987 thru October 1989)	February 1990
Geraghty & Miller, Inc.	Results of the Soil Boring Program Conducted at the GE/Altresco Cogeneration Plant	March 6, 1990
Geraghty & Miller, Inc.	Soil Boring for Altresco Bedrock Well No.5, GE/Altresco Cogeneration Plant	March 13, 1990
Geraghty & Miller, Inc.	Soil Boring for Altresco Meter Pit, GE/Altresco Cogeneration Plant	April 27, 1990

Table 1. Summary of Previous Investigations Conducted at the Hill 78 Area, May 1987 through November 1990, GE Company, Pittsfield, Massachusetts.

Author	Investigation Title/Location	Date of Report
Geraghty & Miller, Inc.	Soil Boring Program for Altresco Tree Plantings, GE/Altresco Cogeneration Plant	April 30, 1990
Geraghty & Miller, Inc.	Soil Boring Program for Building 74 Manhole Excavation	June 6, 1990
Geraghty & Miller, Inc.	Soil Boring Program for Proposed Sewer Line, GE/Altresco Cogeneration Plant	June 6, 1990
Geraghty & Miller, Inc.	Soil Boring Program at GE/Altresco Cogeneration Plant (to Bedrock)	November 28,, 1990

Table 2. Summary of Chemical Quality Data of Water From Selected Wells in Surficial and Bedrock Aquifers*.

Constituent or Characteristic	Stratified Deposits (Sand and Gravel)		Till		Limestone and Dolomite (Carbonates)		Quartzite		Gneiss		Schist	
	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples	Range (ppm)	No. of Samples
Silica	3.4 - 12	12	3.6 - 7.2	4	3.5 - 9.2	15	7.9 - 11	3	8.8 - 15	4	3.3 - 11	6
Iron	.01 - 1.1	16	.04 - .07	4	.00 - .10	16	.00 - .03	3	.03- .99	5	.01 - 1.2	10
Manganese	.00 - .22	12	.00 - .10	4	.00 - .06	15	0	3	.00 - .07	5	.01 - .46	8
Calcium	6.4 - 68	18	19 - 78	7	28 - 85	23	9.6 - 42	3	13 - 26	5	16 - 40	7
Magnesium	.9 - 36	18	5.5 - 26	7	8.8 - 36	23	2.2 - 17	3	2.8 - 13	5	1.0 - 16	6
Sodium	1.1 - 8.5	12	1.1 - 9.5	5	1.3 - 5.3	12	1.1 - 3.7	3	1.7 - 3.6	4	.7 - 16	6
Potassium	.1 - 3.8	12	.4 - 2.2	4	.2 - .30	15	.9 - 4.4	3	1.0 - 2.2	4	.2 - 1.4	6
Bicarbonate	12 - 312	22	34 - 302	8	112 - 340	29	38 - 164	6	59 - 158	8	41 - 169	10
Sulfate	11 - 29	12	12 - 27	5	9.0 - 28	17	4.4 -19	3	4.8 - 17	4	.0 - 22	6
Chloride	1.0 - 21	12	2.0 - 28	6	.8 - 22	12	1.0 - 13	4	1.1 - 8.0	4	1.0 - 22	6
Fluoride	.0 - .2	12	.0 - .1	4	.0 - .1	15	.1 - .2	3	.0 - .1	4	.0 - .2	6
Nitrate	.0 - 6.8	12	.2 - 20	6	.1 - 19	17	.9 - 14	4	.0 - 3.7	4	.0 - 1.8	6
Dissolved Solids (Residue on evaporation at 180°C)	29 - 278	12	89 - 245	4	141 - 308	11	50 - 222	3	74 - 132	4	59 - 176	6
Hardness as $CaCO_3$												
Calcium, Magnesium	20 - 270	22	74 - 302	8	106 - 356	29	32 - 175	6	44 - 143	8	44 -143	10
Noncarbonate	0 - 48	22	8 - 58	8	4 - 141	29	1 - 41	6	0 -14	8	0 -18	10
Specific Conductance (Micromhos at 25°C)	48 - 512	22	168 - 567	8	208 - 874	29	72 - 358	6	107 - 282	8	96 - 289	10
pH	6.6 - 8.2	22	6.9 - 8.4	8	7.1 - 8.3	29	7.1 - 7.8	6	7.5 - 9.0	8	6.7 - 8.1	10
Color	1 - 4	12	1 - 4	4	1 - 3	15	1	3	1 - 2	4	0 - 6	6
Turbidity	.3 - .5	2	-	-	0.1	1	-	-	-	-	0.7	1
Temperature (°F)	36 - 56	22	38 - 54	8	45 - 59	29	46 - 54	6	43 - 57	8	41 - 56	9

* Source - Norvitch, Ralph F., D.F. Farrell, F.H. Pausek, and R.C. Peterson. 1968. Hydrology and Water Resources of the Housatonic River Basin, Massachusetts. U.S. Geological Survey Hydrologic Investigations Atlas HA-281.

Table 3. Summary of Photoionization Detector (PID) Results for Soil Samples Collected at GE Company, Hill 78 Area, Janu through 10, 1991, Pittsfield, Massachusetts.

Sample Location	Depth (Feet) and Correlating PID Results (ppm)[a]													
	(0-2)	(2-4)	(4-6)	(6-8)	(8-10)	(10-12)	(12-14)	(14-16)	(16-18)	(18-20)	(20-22)	(22-24)	(24-26)	(2
78-1	0.0	0.0	0.0	0.0	0.0	0.0	39.4	0.0	0.0	0.0	0.0	NA	NA	
78-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	
78-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	
78-4	0.0	0.0	2.4	0.0	0.0	0.0	0.0	1.7	0.8	1.9	0.2	NA	NA	
78-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	NA	
78-6	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0	0.0	NA	NA	NA	NA	
78-7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

a) These results are qualitative only and do not represent the absolute concentrations of any volatile organic compound in the soil core, wl the compound is natural or man-made.

NA Not applicable; boring did not extend to this depth.

Table 4. Well Construction Summary and Survey Information for Monitoring Wells Installed at GE Company, Hill 78 Area, April 25 through 27, 1988 and January 2 through January 10, 1991, Pittsfield, Massachusetts.

Well Designation	Elevation[a] of Measuring Point[b]	Depth of Well(ft)	Screen Length(ft)	Depth of Screen(ft)	Elevation[a] of Screened Interval	Elevation of Grade (Land Surface)
78-1	1027.19	23.0	15.0	8.0-23.0	1019.19-1004.19	1027.40
78-2	1034.80	21.0	15.0	6.0-21.0	1028.80-1013.80	1034.90
78-3	1007.97	25.0	15.0	10.0-25.0	997.97-982.97	1008.10
78-4	999.38	21.0	15.0	6.0-21.0	993.38-978.38	999.50
78-5	997.72	17.0	15.0	2.0-17.0	995.72-980.72	997.80
78-6	1012.96	18.0	15.0	3.0-18.0	1009.96-994.96	1013.10
78-7	1018.55	28.0	15.0	13.0-28.0	1005.55-990.55	1019.00
NY-1	988.90	15.0	12.0	2.5-14.5	986.4-974.4	NM
NY-2	993.51	25.0	15.0	9.5-24.5	984.01-969.01	NM
NY-3	1005.78	25.0	15.0	10.0-25.0	995.78-980.78	NM
NY-4	1024.65	33.0	15.0	17.0-32.0	1007.65-992.65	NM

[a] Elevation given in feet above mean sea level.
[b] Measuring point is the top of the PVC casing.
NM Not measured.

Table 5. Water-Level Elevation Data, Collected Winter and Summer 1991, Hill 78 Area, GE Company, Pittsfield, Massachusetts.

Well	Date of Measurement	Elevation of Measuring Point	DTW (feet)	Ground-Water Elevation (feet)
78-1	1-22-91	1027.19	9.08	1018.11
	7-1-91	1027.19	11.87	1015.32
78-2	1-22-91	1034.80	6.38	1028.42
	7-1-91	1034.80	8.80	1026.00
78-3	1-23-91	1007.97	8.71	999.26
	7-1-91	1007.97	17.71	990.26
78-4	1-23-91	999.38	10.42	988.96
	7-1-91	999.38	12.97	986.41
78-5	1-23-91	997.72	3.91	993.81
	7-1-91	997.72	4.83	992.89
78-6	1-23-91	1012.96	6.86	1006.10
	7-1-91	1012.96	10.42	1002.54
78-7	1-24-91	1018.55	11.35	1007.20
	7-1-91	1018.55	18.48	1000.07
NY-1	1-24-91	988.90	3.06	985.84
	7-1-91	988.90	5.29	983.61
NY-2	2-28-91	993.51	14.72	978.79
	7-1-91	993.51	14.45	979.06
NY-3	1-24-91	1005.78	15.22	990.56
	7-1-91	1005.78	15.55	990.23
NY-4	1-24-91	1024.65	8.22	1016.43
	7-1-91	1024.65	11.02	1013.63

DTW Depth to water.

Table 6. Field Measurements of Specific Conductivity, pH and Temperature for Hill 78 Wells, GE Company, Pittsfield, Massachusetts.

Well Designation	Date Sampled	Specific Conductivity (umhos/cm)	pH	Temperature (°C)
78-1	1-22-91	400	7.27	8
78-2	1-22-91	390	6.85	8
78-3	1-23-91	760	7.85	8
78-4	1-23-91	2100	7.65	7
78-5	1-23-91	500	8.55	5
78-6	1-23-91	770	7.70	6
78-7	1-24-91	1100	7.70	8
NY-1	1-24-91	240	9.35	5
NY-2	2-28-91	610	7.07	8
NY-3	1-24-91	270	8.70	9
NY-4	1-24-91	280	8.80	7

Table 7. Summary of Volatile Organic Compounds in Soil Samples, Hill 78 Area, GE Company, Pittsfield, Massachusetts.

Parameter	78-1 (12-14 FT)	78-4 (4-6 FT)	78-6 (10-12 FT)
Acetone	0.014B	0.076B	0.037B
Methylene Chloride	0.013B	0.044B	0.032B

Concentrations reported in milligrams per kilogram (mg/kg). Only detected analytes are shown.
B Indicates the compound was found in the associated blank as well as in the sample.

Table 8. Summary of Semi-Volatile Organic Compounds in Soil Samples, Hill 78 Area, GE Company, Pittsfield, Massachusetts.

Parameter	78-1 (12-14 FT)	78-4 (4-6 FT)	78-6 (10-12 FT)
Benzoic Acid	0.660J		
bis(2-Ethylhexyl)phthalate	0.068J	1.30	0.120J
Butyl benzyl phthalate		0.042J	
Di-n-octyl phthalate	0.038J	0.30J	

Concentrations reported in milligrams per kilogram (mg/kg). Only detected analytes are shown.
J Indicates an estimated value less than the sample detection limit.

Table 9. Summary of Total PCBs in Soil Samples, GE Company, Hill 78 Area, Pittsfield, Massachusetts.

Depth (ft)	78-1	78-1 (8-10) DP-1	78-2	78-3	78-4	78-4 (4-6) DP-3	78-5	78-6	78-6 (12-14) DP-2	78-7
0-2	0.09	NS	0.07	0.01	2.20	NS	0.41		NS	5.30
2-4		NS			0.52	NS	0.05	0.10	NS	780.00
4-6		NS		0.06	0.86	25			NS	210.00
6-8		NS			1.90	NS			NS	280.00
8-10						NS	0.15		NS	348.00
10-12		NS				NS			NS	58.00
12-14		NS				NS				0.92
14-16		NS				NS			NS	1.80
16-18		NS				NS			NS	0.05
18-20		NS				NS	NS	NS	NS	
20-22		NS			0.17	NS	NS	NS	NS	
22-24	NS	NS			NS	NS	NS	NS	NS	0.05
24-26	NS	NS		NS	NS	NS	NS	NS	NS	
26-28	NS	NS		NS	NS	NS	NS	NS	NS	0.91

Concentrations reported in milligrams per kilogram (mg/kg). Only detected analytes are shown.
NS Not Sampled.
DP Duplicate.

Table 10. Summary of Volatile Organic Compounds in Ground-Water Samples, Hill 78 Area, GE Company, Pittsfield, Massachusetts.

Parameter	78-1	78-2	78-3	78-4	78-5	78-6	78-7	NY-1	NY-2	NY-3	NY-4	ASW-3
Methylene Chloride	5BJ	4BJ	32B	42B	8BJ	7BJ	17B	31B	14B	10B	13B	5BJ
Acetone			18B	8BJ	2BJ	5BJ	16B	11B		6BJ	7BJ	6BJ
1,1,1-Trichloroethane				13			4J					
1,2-Dichloroethane				2							2J	
1,2-Dichloroethene (Total)				180							180	
Benzene				1J								
Chlorobenzene				36								
Chloroform				2J								
Tetrachloroethene				5			4J					
Toluene					2J		1J					
Trichloroethene				320E			5					
Vinyl Chloride				23								
Xylenes (Total)					2J							

Concentrations reported in micrograms per liter (ug/L). Only detected analytes are shown.
B Indicates the compound was found in the associated blank as well as in the sample.
E Indicates the compound concentration exceeds the calibration range of the gas chromatograph/mass spectrophotometer (GC/MS) instrument.
J Indicates an estimated value less than the sample detection limit.
ASW-3 Altresco Supply Well #3

Table 11. Summary of Semi-Volatile Organic Compounds in Ground-Water Samples, Hill 78 Area, GE Company, Pittsfield, Massachusetts.

Parameter	78-1	78-2	NY-1	NY-2	NY-4
1,2,4-Trichlorobenzene		2J			2J
1,4-Dichlorobenzene					2J
2,3,4,6-Tetrachlorophenol			14J		
2,4,5-Trichlorophenol			2J		
2,4,6-Trichlorophenol			13J		
2,4-Dichlorophenol			3J		
Benzoic Acid			2J		1J
Di-n-butyl phthalate		1J	1BJ	1BJ	
Isophorone			4J		
Pentachlorophenol			12J		
Bis(2-Ethylhexyl)Phthalate				2J	
Phenols	10.4		45.9		

Concentrations reported in micrograms per liter (ug/L). Only detected analytes are shown.
B Indicates the compound was found in the associated blank as well as in the sample.
J Indicates an estimated value less than the sample detection limit.

Table 12. Summary of Dioxin and Furan Compounds in Ground-Water Samples, Hill 78 Area, GE Company, Pittsfield, Massachusetts.

Parameter	NY-1
Heptachlorodibenzodioxins	15.30
Octachlorodibenzodioxin	83.00
Pentachlorodibenzofurans	1.40
Hexachlorodibenzofurans	7.70
Heptachlorodibenzofurans	26.60
Octachlorodibenzofuran	43.80

Concentrations in nanograms per liter (ng/L).
Ground water from all monitoring wells sampled. Only detected analytes are shown.

Table 13. Summary of Metals and Sulfide in Ground-Water Samples, Hill 78 Area, GE Company, Pittsfield, Massachusetts.

Parameter	78-1	78-2	78-3	78-4	78-5	78-6	78-7	NY-1	NY-2	NY-3	NY-4	ASW-3
Aluminum									0.0577B			
Cadmium												
Calcium	43	44	100	150	60	110	150	42	113E	38	57	48
Iron		0.24				10		0.18	0.0638BE		0.16	
Lead											0.043	
Magnesium	18	21	32	45	14	36	33		40.60	15	24	23
Manganese	0.47		0.02	0.024	0.10	0.52	0.03	0.09	0.07230		0.28	
Mercury		0.00039										
Potassium									11.70			
Silver												
Sodium	27	5	20	270	21	42	74	9.90	19.20	5.90		16
Zinc	0.037			0.021	0.02	0.03			0.025	0.02	0.02	
Barium									0.0896B			
Total Sulfide								1600				

Concentrations reported in milligrams per liter (mg/L). Only detected analytes are shown.
ASW-3 Altresco Supply Well #3.
B Indicates the reported value is less than the contract required detection limit (CDRL), but greater than the instrument detection limit (IDL).
E Indicates the reported value is estimated because of interferences.

Table 14. Summary of Volatile Organic Compounds, Semi-Volatile Organic Compounds, and Pesticides in Surface-Water and Sediment Samples, Hill 78 Area, GE Company, Pittsfield, Massachusetts.

Parameter	Surface-Water		Sediment	
	SW-1	SW-2	SE-1	SE-2
Volatile Organic Compounds				
Methylene Chloride	3.0BJ	3.0BJ		0.045B
Acetone		5.0BJ		0.034B
Semi-Volatile Organic Compounds				
Acenaphthylene				
Fluorene				2.6J
Phenanthrene				4.0J
Anthracene				24.0J
Fluoranthene				2.9J
Pyrene				38.0
Benzo(a)anthracene				28.0
Chrysene				14.0J
Benzo(b)fluoranthene				24.0J
Benzo(k)fluoranthene				36.0X
Benzo(a)pyrene				36.0X
Indeno(1,2,3-cd)pyrene				14.0J
Dibenzo(a,h)anthracene				11.0J
Benzo(g,h,i)perylene				5.2J
Phenols	11,200			13.0J
Pesticides				
Alpha-BHC		0.031		

Surface-water concentrations reported in micrograms per liter (ug/L). Only detected analytes are shown.
Sediment concentrations reported in milligrams per kilogram (mg/kg). Only detected analytes are shown.
B Indicates the compound was found in the associated blank as well as in the sample.
J Indicates an estimated value less than the sample detection limit.
X Indicates coeluting indistinguishable isomers.

Table 15. Summary of Metals and Inorganics in Surface-Water Samples, Hill 78 Area, GE Company, Pittsfield, Massachusetts.

Parameter			Duplicate	
	SW-1	SW-2	SW-1	SW-2
Aluminum	0.117B	0.117B	0.156B	0.37
Barium	0.0156B	0.0101B	0.0212B	0.0145B
Calcium	0.62	29.8	67.1	35.2
Copper		0.0091B	0.0047B	0.007B
Iron	0.149	0.15	0.513	0.765
Lead			0.003	0.0066W
Magnesium	0.22	9.78	23.7	11.6
Manganese	0.0216*	0.039B*	0.245	0.156
Potassium	1.88B	1.80B	1.89B	2.13B
Selenium				0.0091Q
Sodium	41.6	21.3	43PE	24.30E
Thallium				0.0038BQW
Vanadium			0.0041B	
Zinc	0.0062B	0.211	0.0289	0.0291

* Indicates duplicate analyses not within control limits.

Concentrations reported in milligrams per liter (mg/L). Only detected analytes are shown.

B Indicates the reported value is less than the contract required detection limit (CRDL), but greater than the instrument detection limit (IDL).

E Indicates the reported value is estimated because of the presence of interference.

Q Indicates an estimated value due to severe physical or chemical interference.

W Indicates post-digestion spike for furnace AA analysis is out of control limits (85 - 115%), while sample absorbance is less than 50% of spike absorbance.

Table 16. Physical and Chemical Characteristics of Polychlorinated Biphenyls and Volatile Organic Compounds, Hill 78 A GE Company, Pittsfield, Massachusetts.

Specific Gravity	Solubility*[1,2,3]	Specific Gravity	Log K_{ow}[1,3]	Vapor Pressure[1,3]
Polychlorinated Biphenyls	7.0 - 5,900 ng/L	1.18 to 1.44	2.8 - 7.14	4.06×10^{-3}
1,1,1-Trichloroethane	480 to 1,000 mg/L	1.3	2.17	125 mm Hg at 25°C
1,2-Dichloroethene	3,500 to 6,000 mg/L	1.28	1.53	200 mm Hg at 25°C (cis) 200 mm Hg at 25°C (trans
1,2-Dichlorothane	8,000 mg/L	1.26	1.48	60 mm Hg at 20°C
Chlorobenzene	488 mg/L	1.11	2.84	10 mm Hg at 22°C
Tetrachloroethene	150 mg/L	1.63	2.88	20 mm Hg at 26.3°C
Trichloroethene	1,100 mg/L	1.46	2.29	77 mm Hg at 25°C
Vinyl Chloride	2,700 mg/L	0.91	0.60	400 mm Hg at -28°C

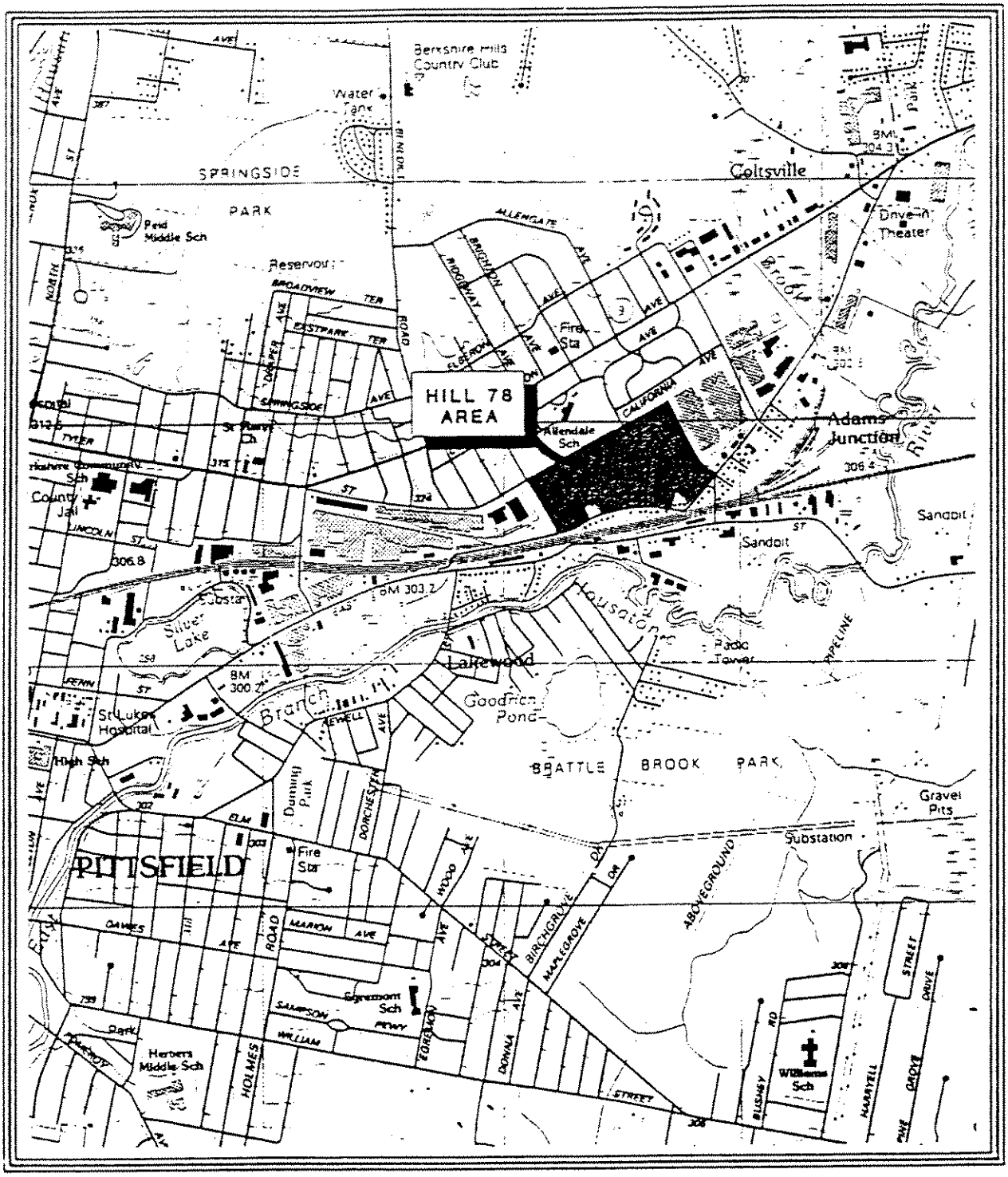
* At 25 degrees Celsius.

Sources:

1 - U.S. Department of Commerce. 1979. Water-Related Environmental Fate of 129 Priority Pollutants, PB80-204373 and PB80-2043 National Technical Information Service, Springfield, Virginia, 105 pp.

2 - Yaws, C.L., H.C. Yang, J.R. Hopper, and K.C. Hansen. 1990. Organic chemicals: water solubility data. Chemical Engineeri July 1990, p. 15.

3 - Chemical Information Systems, Inc. 1991. The CIS (Chemical Information System): An Overview. Baltimore, Maryland.



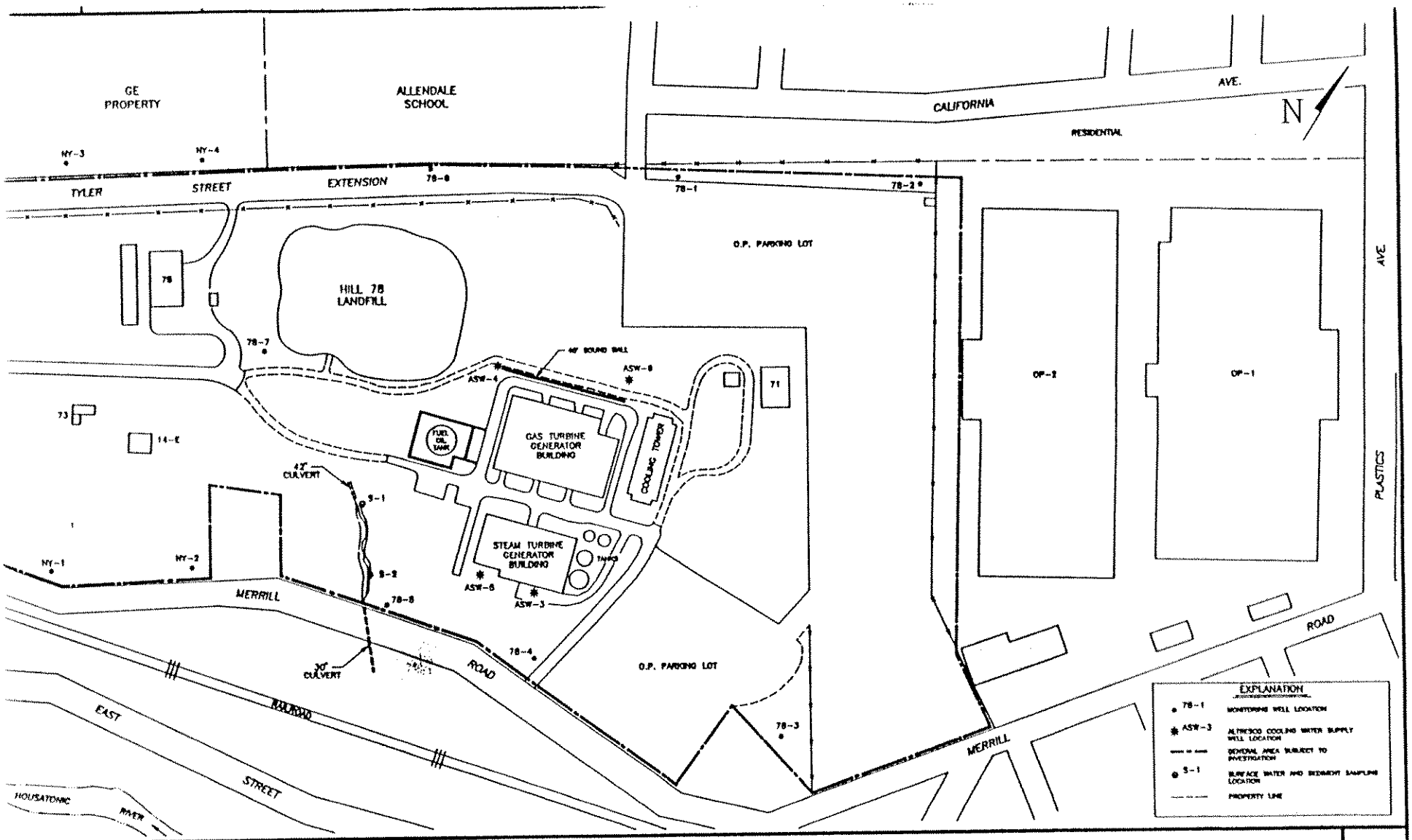
Reference: U.S. Geological Survey, 7.5 X 15 Minute Quadrangle, Pittsfield East, MA, 1988

SITE LOCATION MAP

GENERAL ELECTRIC COMPANY
PITTSFIELD, MA

DRAWN: GLS\NIS	DATE: APR 1991	FIGURE 1
APP'D:		

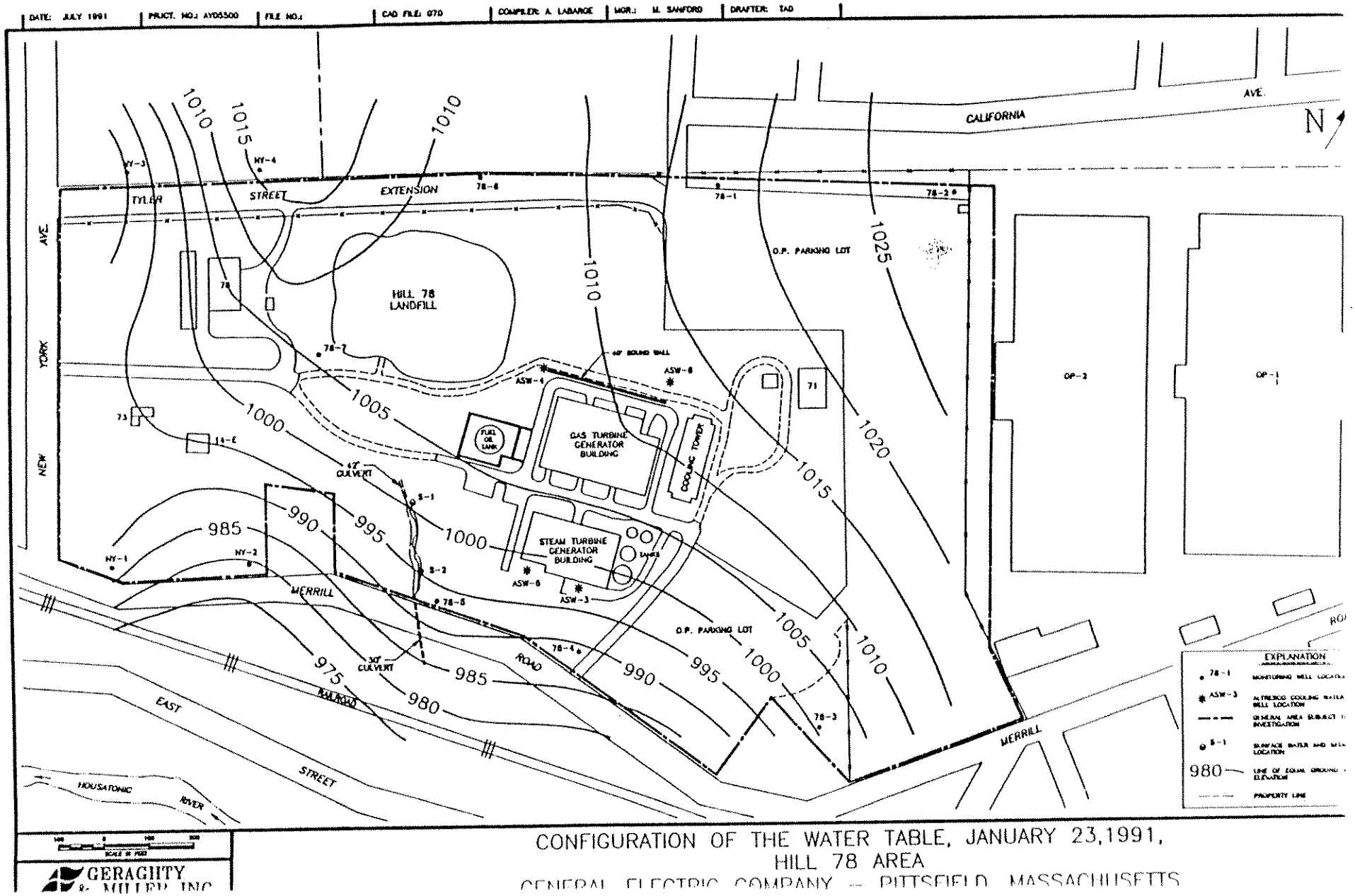
GERAGHTY & MILLER, INC.
Environmental Services



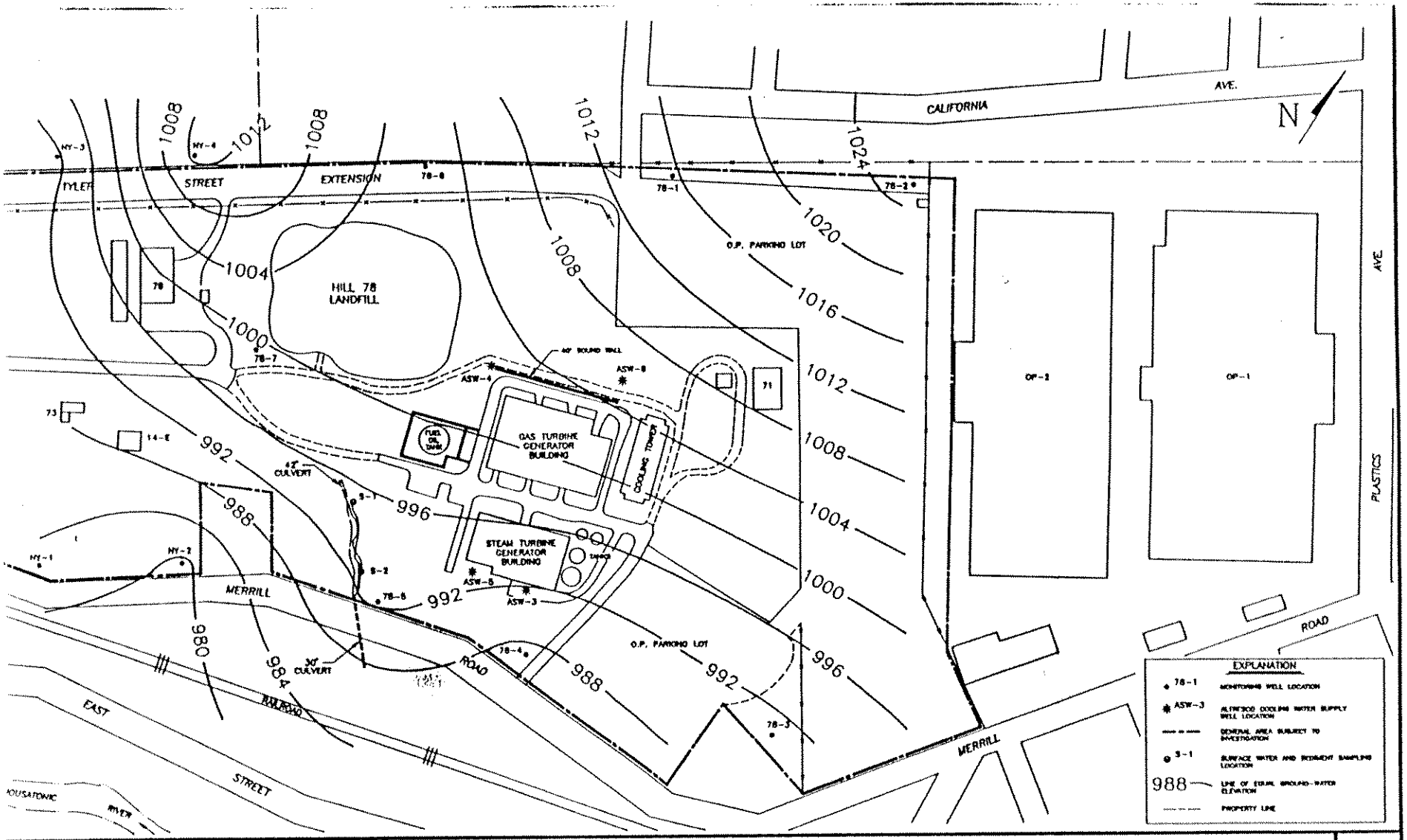
GERAGHTY & MILLER, INC.
Environmental Services

SITE MAP
HILL 78 AREA
GENERAL ELECTRIC COMPANY – PITTSFIELD, MASSACHUSETTS

FIGURE
2



CONFIGURATION OF THE WATER TABLE, JANUARY 23,1991,
HILL 78 AREA
GENERAL ELECTRIC COMPANY -- PITTSFIELD, MASSACHUSETTS



CONFIGURATION OF WATER TABLE, JULY 1,1991,
HILL 78 AREA
GENERAL ELECTRIC COMPANY – PITTSFIELD, MASSACHUSETTS

FIGURE 4

GERAGHTY & MILLER, INC.
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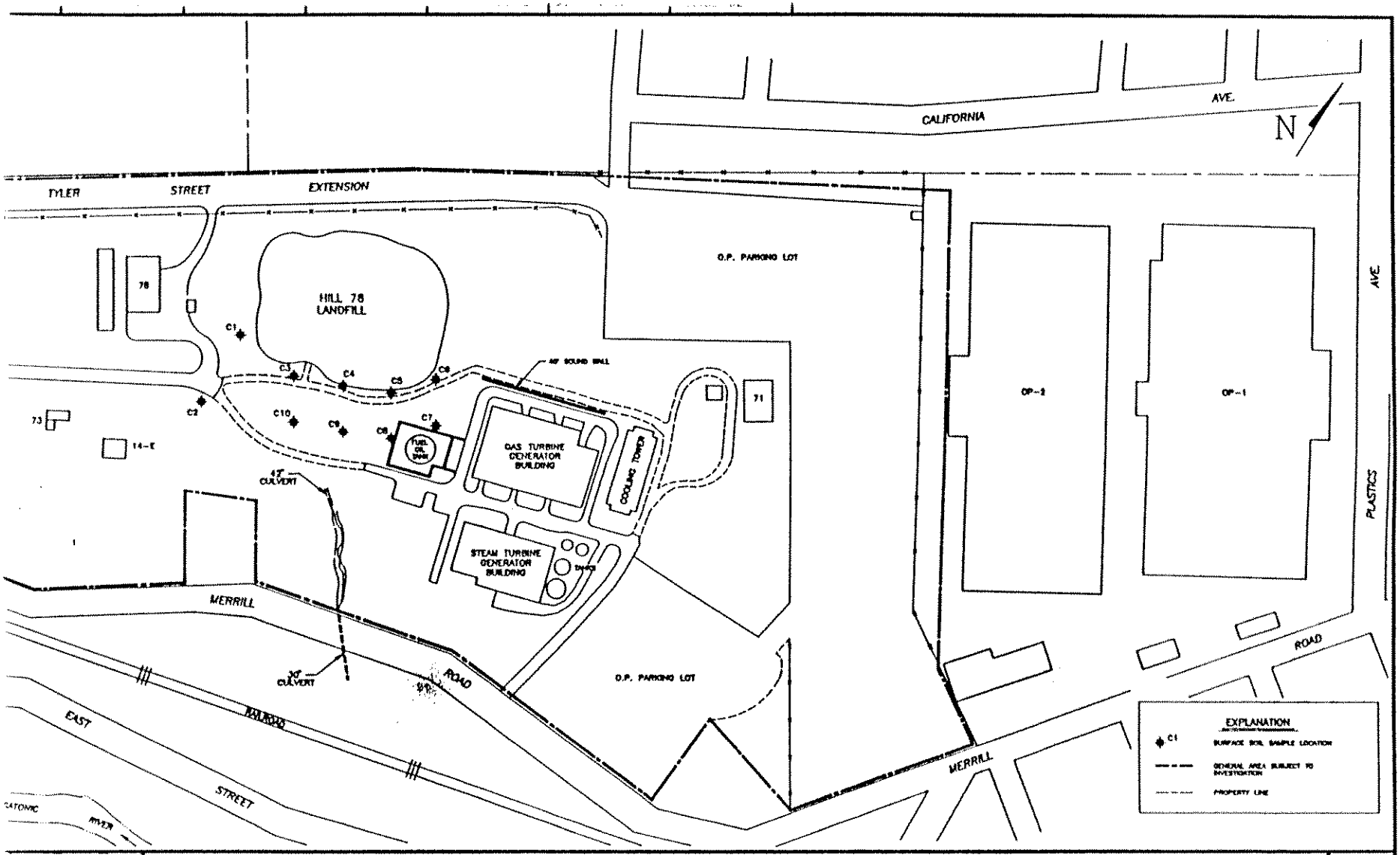

ERAGHTY MILLER, INC.
Environmental Services

SURFACE SOIL SAMPLE LOCATIONS
HILL 78 AREA
GENERAL ELECTRIC COMPANY – PITTSFIELD, MASSACHUSETTS

FIGURE 5